AVIATION WEEK
JUNE 7, 1948
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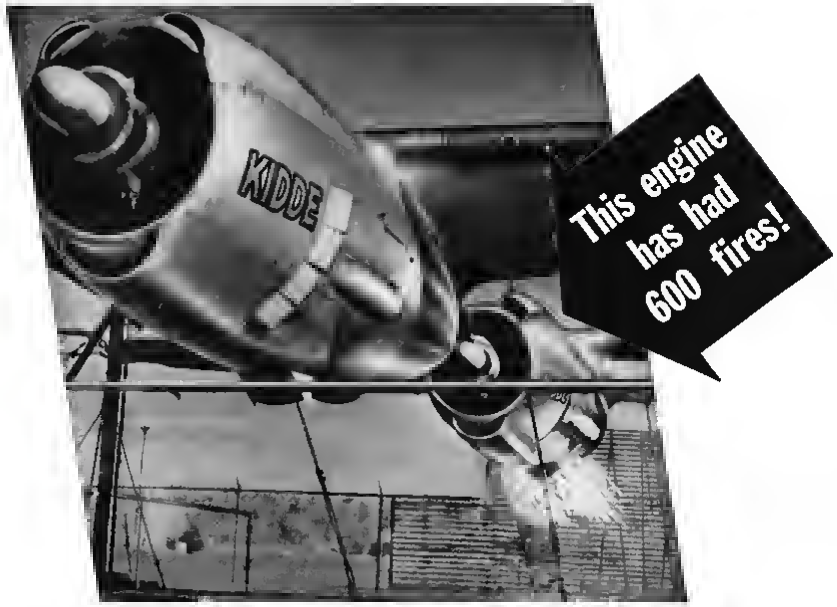


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AVIATION WEEK

Vol. 48 No. 23 — June 7, 1948

The Aviation Week	7	New Products	29
News Digest	8	Financial	31
Headline News	11	Sales & Service	32
Aviation Calendar	16	Briefing for Dealers	35
Industry Observer	16	World News	36
Engineering-Production	17	Transport	37
Editorial	50		

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Research for Survival

Expenditure of 300 to 500 million dollars, enlistment of an army of 100,000 technicians and creation of costly special research equipment is rapidly pulling the United States out of the scientific morass into which it had been forced by World War II. The job has only begun and may require more than a decade of tedious, brain consuming effort. But it is the recognition of the necessity for this effort, even though it is 20 years late, that has made possible the resurgent scientific aeronautical leadership of this nation.

For more than 30 years prior to the end of World War II, U. S. aerodynamic and structural design theory had been shored up by the German mathematical concepts. Major contributions had also been made by British, Italian, Japanese and Russian researchers. It was the mating of this foreign-born theory with native-born capacity for design and production that produced war-winning U. S. aircraft in World War II.

Arrested Development

Early in 1945 several factors converged on this fragile structure to threaten it with a seriousness only a few scientific men fully appreciated. (1) U. S. scientific research was arrested in 1942-43 in favor of the more pressing job of "fixing" current production aircraft; (2) German research as well as other foreign data, was cut off at the source, and (3) The increase in speed of aircraft put them into sonic difficulties, which were not thoroughly understood by the researchers of any nation.

By V-J Day the U. S. had drained its own scientific reservoir dry, had lost its foreign supply and had run full against an entirely new field of scientific effort: supersonics. The government then took the only course open to it: returned the National Advisory Committee for Aeronautics, its aeronautical research agency, to fundamental research; hastily brought home and analyzed German wartime data, and authorized thousands of basic research contracts through the NACA, the Air Force, Army Ordnance, Navy Bureau of Aeronautics, Navy Bureau of Ordnance, Bureau of Standards, in short all government agencies of scientific segments. Thus, the U. S. embarked on the most ambitious aeronautical research program in its history to create a new national resource—scientific theory—almost from scratch.

Mixed-Flow Problem

What theories are needed? Most pressing is an understanding of mixed-flow phenomena, that complex whirlpool over an airplane that results at speeds from 85 percent to 105 percent that of sound when portions of the air are at subsonic speed and portions are at supersonic speed. On either side of this transonic zone conditions are stabilized and supported by theory. Here are the theories badly needed:

Air in Motion—How can lift be obtained and drag be reduced? How can stability be attained and, lacking this inherent property, how can the airplane be controlled? How can air be routed, twisted, compressed, expanded and ejected with maximum efficiency inside the airplane and its engine?

Building the Pieces—How can extra-thin wings be made rigid enough to prevent deadly vibration and flutter from twisting them off? How do the erratic and sledgehammer blows of transonic speed travel through the airplane structure from skin to rib to spar to fuselage? Do they concentrate or dissipate in certain structural systems? How does the structure weaken then resist under these 50-ton impacts? What changes in the resistance of these structures are created by temperature extremes? Are they as efficient at −70 degrees F as at 200 degrees F?

Providing the Power—How can air be compressed to one-tenth or one-twentieth of its volume without adding excessive weight to the engine? How can more work energy be taken out of the engine heat cycle? How can the high costs of water injection, tailpipe afterburning, air bleeding and heat regenerating be reduced to practical limits of weight, space and consumption while still providing adequate thrust augmentation? How can materials preserving their room temperature strength at 2-300 degrees F be developed and produced at competitive costs?

New Techniques Required

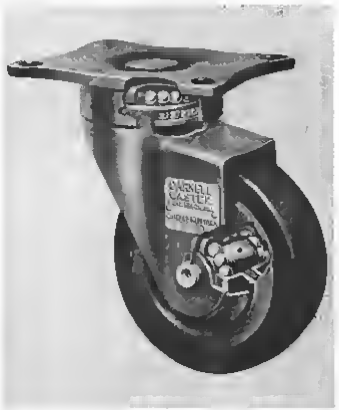
Research is even required to develop new research techniques and equipment required to perform the above research. For example, new methods of starting large, supersonic wind tunnels are urgently required since the initial acceleration of the air to supersonic speed constitutes the major power drain on the facility. New techniques are required to reduce the size of wind tunnels presently needed to perform transonic research. New data is needed on heat transfer theory from bodies to the air since the heat generated on sonic wind tunnel models cannot be dissipated as it is by a full-scale airplane but is reflected back to the model by the tunnel walls. And little sonic wind tunnel data will be useful until the exact effect of Reynolds Number at these speeds is determined. (It was believed first that there was little Reynolds Number effect at supersonic speeds since the air is no circulation but researchers now believe that its effect may be as pronounced at supersonic speeds as it is at subsonic speeds.) Needed, too, are great improvements in rocket telemetering, radar tracking, and instrumentation research techniques.

Cut-and-Try Outmoded

It is not enough to produce answers to these questions by the old Yankee cut-and-try method. This research program must produce simple mathematical equations into which any given numbers may be inserted and the answer derived certain to produce a series of correct afterbody ordinates, a nozzle area or a trim tab shape without a model, a test or an interminable series of changes in forms.

Assuredly there are huge and unpredictable problems lurking in the future of aeronautical science. While the layman finds it difficult to translate a new general instability structural theory into terms of machine guns and bombs, the services and the industry knows well that without such a theory a fuselage structure is merely an educated guess fortified by costly static tests. These are the reasons this nation is spending 300-500 million dollars on aeronautical research and these are the reasons the United States can emerge as the premier aeronautical nation in the world: self-sufficient in scientific theory, unmatched in production "know how", one useless without the other, both indispensible in forging omnipotent air power.

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NEWS DIGEST

DOMESTIC

Thomas A Morgan, chairman of the board, Sperry Corp., was presented with the President's Certificate of Merit, by Defense Secretary Forrestal for Morgan's World War II research, development and production contributions.

Pan American World Airways has begun an all-cargo schedule to Alaska, June 1. A specially equipped DC-4 flies from Seattle to Fairbanks with stops on demand at Juneau and Ketchikan.

Harold F Hammond, new manager of the transportation and communication department of the U. S. Chamber of Commerce, has taken office succeeding Col. A. B. Barber, who held the office for 25 years.

Bill establishing the Civil Air Patrol as a civilian auxiliary to the Air Force, has been passed by Congress and sent to President Truman for his action. Measure authorizes Air Force to provide obsolete or surplus aircraft, gasoline and other supplies to CAP.

FOREIGN

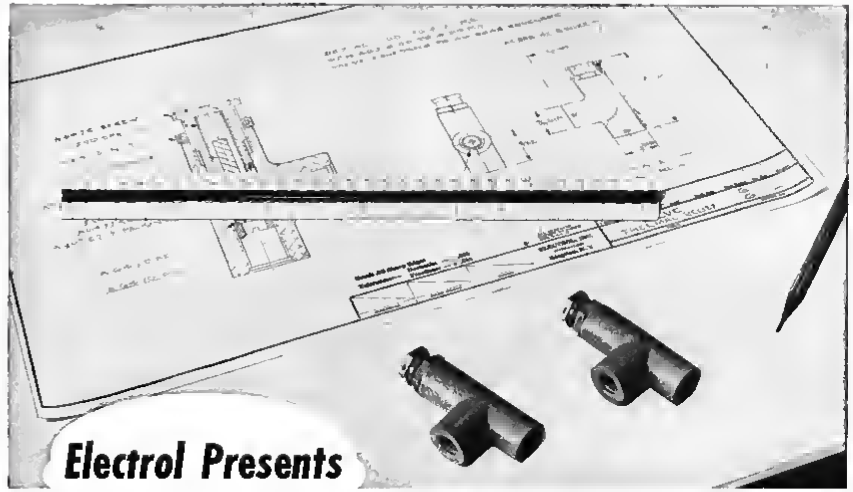
Six British shipboard fighters, including a jet Sea Vampire, two single-engine Sea Furies, and three twin-engine Sea Hornets, will participate in the New York Golden Jubilee air show at International (Idlewild) Airport, July 31 to Aug. 8.

U. S. Ambassador Walter Bedell Smith has notified the Soviet Union that the U. S. has rejected protests against low flying U. S. military and Naval aircraft in the western Pacific. Low flying is necessary, the State Department said, for recognition purposes in coastal patrol.

KLM, Royal Dutch Airlines has placed new Douglas DC-6 planes in service on the airline's Amsterdam-Johannesburg service, with sleeper berths $50 extra per night. A three day service between the U. S. and South Africa, with Amsterdam connections, is now offered.

Convair Liners purchased by Trans-Australian Airlines will cover 19,000 miles on their seven-day delivery flight from San Diego to Melbourne via Canada, Labrador, Greenland, Iceland, Scotland, England, France, North Africa, Egypt, Arabia, India, Malaya, the Netherlands East Indies and Timor. This route, lengthy though it is, will save some $40,000 in extra fuel tank modifications required for a Pacific delivery flight.

Air France 749 Constellation flew non-stop from Paris to New York in 16 hr. 2 min. Piloted by Capt. Loubry, average speed was 235 mph.



2 Newly Developed Thermal Relief Valves

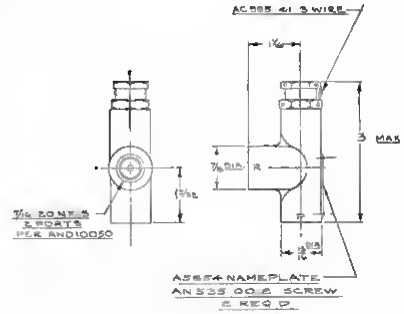
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Diagrammatic sketch of Thermal Relief Valve

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Vol. 48, No. 23 AVIATION WEEK June 7, 1948

USAF, Navy to Order 3300 New Planes

Contracts total nearly two billion dollars as Administration withholds part of funds.

By Robert Hotz

A record peacetime total of $1,998,800,000 in procurement funds for 3300 new planes began flowing into the aircraft industry last week

Telegraphic letters of intent have already gone out from Air Materiel Command headquarters at Wright Field to manufacturers included in the Air Force $1,345,165,000 new aircraft program for fiscal 1949. Navy does not expect to completely allocate its $653,635,000 before next fall

▶**Initial Orders Cut**—Initial plane orders fell short of the total authorized by Congress. President Truman, the Budget Bureau and Defense Secretary Forrestal combined to trim approximately 13 percent from procurement funds authorized by Congress. The aircraft procurement program will be reviewed by the President next September and again in December. Then, remainder of the funds may be spent or the program curtailed further, depending primarily on the international situation and the state of domestic economy

Congress authorized the Air Force and Navy to spend a total of $2,798,000,000 for new aircraft in fiscal 1949 in addition to providing $400,000,000 to liquidate previous contract authority. This would have purchased 4262 new planes

The Air Force funds include $700,000,000 in the original fiscal 1949 budget, $415,000,000 added by the President after the fight over the 70-Group program developed and $230,000,000 salvaged from the $822,000,000 added to the Presidents' proposals by Congress. Of this extra $822,000,000, added by Congress only 52 percent or 427,000,000 was for new aircraft. The remaining 48 percent ($395,000,000) was for modifying storage aircraft, tooling and subcontracting costs. No action has yet been taken to determine whether the $395,000,000 will also be cut. After the Truman-Forrestal cut, the USAF has $197,000,000 in procurement funds remaining which may be used after the Presidential quarterly reviews of the aircraft program. With funds approved by Forrestal, the Air Force will now buy 2100 planes instead of the 2727 authorized by Congress.

▶**Navy Program**—Navy will now buy approximately 1200 planes instead of the 1535 approved by Congress. Naval Aviation procurement funds took a cut of $99,365,000 from the $753,000,000 originally submitted in the President's budget and approved by Congress. Navy is now authorized immediate expenditure of $653,635,000 with the fate of its balance of $99,365,000 to be determined by later Presidential review.

This 3300 plane production level compares with the 3000 plane annual production level set by the Air Coordinating Committee as the bare peacetime minimum required to keep the aircraft industry capable of maintaining technical leadership and expansibility for emergency operations. To meet the requirements of a pre-war period of increasing international tension the ACC specified a 5700 plane annual production rate.

Air Force procurement officials estimate that immediate action in obligating their entire authorized procurement funds has saved at least five critical months in reviving productive capacity of the aircraft industry. Normally the funds made available at the beginning of the new fiscal year, July 1, would not be obligated until next October. Navy has indicated it will follow this procurement tradition.

▶**Save Skilled Workers**—Air Force speed was also motivated by severe lay-offs of skilled personnel impending in many of its key contractors' plants due to lack of additional orders. These threatened lay-offs could have easily set back industrial recovery by another year if they were not checked until fall.

Aircraft Industries Association estimates that the industry will require an additional 100,000 production workers and engineers during the next two years to carry out the procurement program. Bulk of the planes to be purchased will be delivered during the calendar year 1950.

▶**Bottlenecks Listed**—AIA anticipates biggest bottlenecks will be in jet engines, skilled labor and accessories.

Since all of the major airframe manufacturers do not have flying prototypes suitable for quantity production considerable subcontracting of major airframe assemblies will be used to retain the productive capacity of these firms that will not be prime contractors under the current program. Some manufacturers will be expected to sub-contract up to 80 percent of their work on certain type planes. Subcontracting reached a peak of 50 percent during the war and has shrunk in post war years to about 15 percent. Many manufacturers will find difficulty in renewing their relations with accessory subcontractors, many of whom have left the aircraft field and are now fully committed elsewhere.

Financially the current program is expected to put the industry as a whole into the black for fiscal 1949 and 1950.

Wright Flyer Returns

The 45th anniversary of the first power plane flights by the Wright Brothers at Kitty Hawk, N. C., next Dec. 17, is expected to mark the return of the original Kitty Hawk plane to America.

The 12 hp. biplane, which has been loaned to the Science Museum near London since 1928, is to be turned over to the custody of the National Museum, and will be exhibited in the Smithsonian Institution in the first place of honor now occupied by Charles A. Lindbergh's "Spirit of St. Louis."

Later it is to occupy the first place of honor in the new air museum, which has been authorized by Congress, when that building is constructed.

It is expected to arrive a few weeks in advance of the Dec. 17 anniversary, so that Dr. Paul Garber, aeronautics curator of the Smithsonian, will have time to reassemble it.



MAMMOTH SIZE OF XC-99

This new view of Consolidated Vultee's XC-99 troop transport and cargo plane with its engines warming up once again offers an appreciation of the planes tremendous size, as well as the aerodynamic cleanness of the pusher engine installation

Bill Asks Giant Research Center

USAF would get primary responsibility in operating facility for work on supersonic weapons and planes.

The Air Force has won a major victory in the jurisdictional rowing among the services over research and development of guided missiles and piloted and pilotless supersonic aircraft

Chairman Chan Gurney (Rep., S. D.) of the Senate Armed Services Committee introduced legislation authorizing the Air Force to establish an air engineering development center—its total cost is estimated at $1,000,000,000 by USAF—and a joint long range proving ground for guided missiles

Since the end of the war, when the proposal was first made by Maj. Gen. Curtis LeMay, the Navy has had its doubts of centralization of supersonic aircraft development in a gigantic center operated by USAF. Army's Ordnance Department has been apprehensive of USAF invasion of the rocket and missile field, which it considers its own.

► **Supersonic Tunnels**—The bill directs the Secretary of Air to establish the air engineering center to "conduct sponsor, and encourage research development, and evaluation in all fields of science pertaining to the military needs of the Air Force including supersonic piloted and pilotless aircraft." The main feature of the center would be several supersonic wind tunnels. The measure makes no provision for participation by the Navy or NACA, and sets no limitation on cost.

Authorization for the center to engage in "development" activities—defined in the Gurney bill as "the application of fundamental laws and principles resulting from research"—may provoke opposition from manufacturers who favor restricting this field to private enterprise.

The Secretary for Air is directed to establish the joint guided missile proving ground "for scientific study, testing and training purposes" on "guided missiles and other weapons" by the Army, Navy and Air Force. Under the measure, funds for the proving ground would be made available to USAF, and would be open for obligation over a five-year period. The Army and Navy are authorized to transfer funds to USAF for engaging in activities at the proving ground.

► **Other Legislation**—Meanwhile, Congress moved forward on four other measures aimed at promoting aviation research and development.

• Action was completed on legislation increasing the membership of NACA from 15 to 17. The President promptly signed the bill.

Legislation authorizing NACA to establish ten additional professional and scientific posts paying from $10,000 to $15,000 a year was introduced in the house by Chairman Ed Rees (Rep., Kans.) of the House Post Office and Civil Service Committee. The measure is pending before Rees' committee.

Legislation authorizing six scientific or professional positions, paying $10,000 to $15,000 a year for the Research and Development Board of the National Military Establishment was introduced in the House by Chairman Walter Andrews (Rep., N. Y.) of the House Armed Services Committee. A companion bill was approved by the Senate Armed Services Committee with an amendment which would cut back the number of scientific and professional posts now authorized for the three services by six.

The Senate committee's bill would be tantamount to transferring two research and development posts from USAF, Army, and Navy, to the over-all Research and Development Board. The services are now authorized 15 posts each, under the Senate committee's bill the number would be 13 each.

In addition to those bills, an omnibus measure making comprehensive changes in military research and development policies was approved by Senate Armed Services Committee. It would:

• Authorize the Secretaries for Air, Army, and Navy to establish research and development advisory committees in their departments or for any of their bureaus or offices as they saw fit. Advisors would be paid $35 a day, plus travel expenses and $10 a day subsistence.

• Authorize a five-year availability for research and development appropriations, opening the way for long range projects. Appropriations obligated in the year for which they were made would continue available for expenditure for the four following years, and could be re-obligated for different projects. At present, military appropriations not obligated during the year for which they were made revert to the Treasury.

• Authorize the services to finance facilities for research development and testing up to $100,000. If the facilities are not established on government property, or are not easily removable, the services are required to enter an agreement on their sale price with the private contractor on whose premises they are to be located.

• Authorize the three service secretaries to publish and disseminate information obtained from research and development programs as far as is consistent with national security.

Willis Quarter Report

Willis Air Service reports net income of $947 in the first quarter on total operating revenues of $72,246. Company had 179 employes in March. Freight ton miles flown totaled 130,165 in January, 33,796 in February and 144,090 in March. Two DC-4s were sold to the Flying Tiger Line.

Airmail Pay

Committee has approved 1949 appropriation but calls it largely a subsidy.

The Senate Appropriations Committee grudgingly has approved $58,583,000 for airmail payments for the coming fiscal year with the comment that 'subsidy represents the major portion of this amount.'

Legislation "which will divorce subsidy from legitimate airmail transportation costs so that the true picture can be made available to the American people" was urged. Chairman Ed Rees (Rep., Kans.) of the House Post Office and Civil Service Committee, which has already held hearings on the subject, promptly announced plans to push a measure under which "service" payments would be made airlines by the Post Office Department, and "subsidy" payments would come out of direct appropriations made to the Civil Aeronautics Board for the purpose.

► **Funds Apportioned** — The $32,000,000 recommended by the Senate group for domestic airmail was the amount approved by the House, and $3,588,000 below the $35,588,000 requested by the Budget Bureau. The current-year domestic airmail appropriation totaled $47,000,000.

The $26,583,000 allowed by the Senate committee for foreign airmail payments was also substantially below this year's allocation of $40,500,000. It was the amount recommended by Budget Bureau, but higher than the $19,500,000 recommended by the House, which slashed $7,083,000 from the budget figure on the grounds that the amount required for payments on several routes could not be determined with any accuracy since rates had not been set.

The pared-down appropriations for fiscal 1949 airmail payments approved by the Senate committee will make necessary substantial requests for deficiency airmail funds next year.

► **Carriers Compared**—Testimony presented the Senate committee indicated that American Overseas Airlines is the highest cost and TWA the lowest cost operator over the North Atlantic route. For the third quarter of 1947, AOA's operating expenses were set at $2.54 per mile, compared with $2.68 for Pan American Airways and $2.79 for Trans-World Airways.

Operating costs for the period over other international routes operated by PAA were given as: Latin American $1.94 per mile, Alaska $2.41, and Pacific, $2.00. Chicago and Southern's New Orleans-Havana operating costs were set at $1.96 per mile.

► **Expenses Cut**—With the exception of PAA's Latin American and Alaskan services, operating costs over U. S. international routes markedly decreased during 1947. Pan American's operating cost of $1.47 per mile on its Latin American routes at the end of 1946 compared with $1.94 at the end of 1947, and its cost of $1.66 per mile on Alaskan service at the end of 1946 compared with $2.41 at the end of last year.

In its report urging separation of service and subsidy payments to airlines, the Senate committee predicted "increasing competitive air transportation will unquestionably result in further increasing subsidies." It objected to retroactive mail payments as "a means of underwriting any losses whatever."

The committee questioned use of mail pay for "expensive experiments in the domestic airline pattern" (such as feederlines) and complained that "spectacular profits in past years ... are not considered in ... current petitions for airmail pay increases."

Conflict Eased

New plane development bill gives civil board primary control.

Shift from military to civil control of federal development for new transport and cargo plane prototypes was embodied in legislation last week.

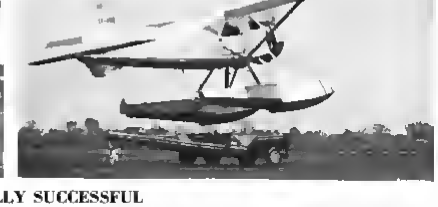
The new measure resolves the conflict between military and civil agencies over the proposed program (AVIATION WEEK, May 31) by placing primary control of the program with a civilian dominated board and giving the Secretary for Air veto power over the board. This compromise measure is backed by the Congressional Aviation Policy Board and will be pushed in the Senate by Owen Brewster (R., Me.) and in the House by Carl Hinshaw (R., Calif.). Its chances for enactment before end of the current Congressional session appear bright.

► **Board Explained**—The original legislation sponsored by the Congressional Aviation Policy Board placed the program under the Secretary for Air, providing for an advisory Civil Air Transport Evaluation and Development Board—composed of representatives from the Air Force, Navy, NACA, CAA and CAB—and a six-member industry advisory committee.

The new bill, now backed by Brewster and Hinshaw, would give the Secretary for Air veto power only over the civilian-dominated Civil Air Transport and Development Board. A six-member industry advisory committee, paid $50 a day plus $10 subsistence, would function under the board, instead of the Secretary.

► **Highlights of Measure**—Following are highlights of the measure which carries out the recommendations of CAB Chairman Joseph O'Connell. These





TAKEOFF DOLLY SUCCESSFUL

A practical test of a long-proposed device, the takeoff dolly for aircraft without landing gear or with float gear, proved successful when de Havilland Aircraft of Canada flew a float-equipped Beaver from de Havilland Airport to Toronto Island water airport. The plane was airborne in only 200 ft. The dolly is equipped with a castering tail wheel and four mainwheels of the Beaver landing gear. A power-driven version of the dolly for landing at airports has been proposed by Lewis Rodert, NACA engineer.



BRITISH JET TRAINER

With a top-speed of 585 mph, the British claim their Gloster Meteor VII is the world's fastest training plane. This version of the Meteor is distinguished from standard models by its elongated canopy, tandem seating for instructor and dual controls

compromised the position taken by the Air Force, favoring all-out military control of the program, and the Commerce Department, favoring all-out civilian control by the Commerce Department.

- The Civil Air Transport Evaluation and Development Board would survey the national requirements for "aircraft types designed primarily for commercial transport and cargo service, but adaptable also as auxiliary military transport" and recommend development of types to the Secretary for Air.
- Upon approval of the board's recommendations, the Secretary would be authorized to expend Air Force appropriations on "design, development, testing, tooling, construction, and modification" of prototypes.
- Contracts with manufacturers for prototypes would allow "a reasonable profit, not exceeding such profit as may be prescribed by the secretary."
- Planes ultimately sold by the manufacturer could not reflect developmental costs, borne by the Air Force.
- Aircraft manufactured from the Air Force-financed prototypes could embody only changes approved by the Secretary.
- Should the board and the Secretaries for Air and Navy concur on a seaplane or lighter-than-air development, the program would be undertaken by the Navy. Air Force funds would be transferred to the Navy for the program.

New Radar Net

Legislation authorizing the Air Force to establish a radar warning net was introduced last week by Chairman Chan Gurney (R., S. Dak.) of the Senate Armed Services Committee. USAF sets the cost for the project at $31,000,000.

Budget Bureau recently rejected a request for funds for the net on the grounds that authorizing legislation is necessary.

Rentzel Sworn In As New CAA Chief

With urgency dwindling rapidly in Congress for any early enactment of the proposed legislation for reorganization of CAA, it appeared probable that Delos Wilson Rentzel would not have to worry about being reorganized out of a job, at least until next January. He was sworn in last week as the new Administrator of Civil Aeronautics.

Reports at the Capitol are that the CAA reorganization is regarded by Congressional leaders as one of the controversial measures which could well be postponed in favor of more immediately necessary legislation.

▶ **Sawyer Officiates**—Rentzel, a big 38-year-old Texan, took his oath of office June 2, with Charles E. Sawyer, Secretary of Commerce, administering the oath. Fred B. Lee, who has been acting administrator since resignation of T. P. Wright Jan. 24, resumes his post as deputy administrator.



Delos Rentzel—job safe for a while.

Steady progress next winter and in the following winters toward greater regularity and safety of bad weather flying is predicted by the new administrator if the proposed new billion dollar all weather airway system is developed according to the present plans. (AVIATION WEEK May 31.) Within five to eight years he expects airlines will be "reasonably close" to the ultimate goal of all weather flying.

▶ **Aero Club Speech**—Speaking before the Aero Club of Washington on the same day he took office, Rentzel declared that while the aviation manufacturing industry is currently on its way back to good health as a result of the new military orders, its long term stability must depend on building civil aviation.

He believes all weather dependability for the airlines will result in use of thousands of transports, and that the system will also increase greatly the utility of personal aviation.

He called for development of personal plane designs with greater utility, and for additional airports to serve them.

Over-regulation of aviation has been an outgrowth of regulations adopted after specific accidents, he believes.

"I am hopeful that we can work out a more reasonable and sensible system," he said, "but as long as aviation is not a static industry there will continue to be a minimum amount of chaos."

Rentzel resigned as president of Aeronautical Radio, Inc. to take the top CAA appointment. He was succeeded by R. O. Smith, formerly vice president of Aerine, a radio service operating facility for the airlines.

C-46 Leases Approved

Applications of 17 airlines to lease a total of 76 C-46S from military storage at $300 a month per plane have been approved by the Air Force. Requests for 27 other aircraft are under consideration.

More U.S. Planes Wanted by BOAC

Indications that Great Britain will have to buy more U. S.-made transport planes have been strengthened by Sir Miles Thomas, deputy chairman of British Overseas Airways Corp.

He has little doubt that provision will be made for purchase of American aircraft as needed by British airlines, he told AVIATION WEEK. "We simply will have to prove to Commons and the Treasury that your dollar-purchased aircraft are a sound investment in advancement of British air transportation," he said.

"Your aircraft decidedly have profit-making advantages over any others now available. That is why we have just bought five Irish Model 749 Constellations, and why we are extremely anxious to gain delivery of the six Stratocruisers."

▶ **Out of Market**—The British have been out of the market for U. S. aircraft since they ordered, and got, 10 Constellations on quick delivery about two years ago when it became apparent their own projected long-range transports were months away.

There have been recurrent reports of late that because of the non-competitive showing of the Tudors BOAC is anxious to obtain more U. S. aircraft. British jet transports still are years away and Thomas made the frank remark in the AVIATION WEEK interview that "We are far from being able to make efficient use of the jet transport, even if we had it."

▶ **New British Types**—While stating that U. S. aircraft today are the most profitable, Thomas said that the British industry has under development new transport models which should prove to be competitive.

"We are well into the early part of Phase III of our transport production program with such designs as the short-range Hermes the Bristol MRE (Medium Range Empire), the twin-engine Airspeed Ambassador, and the deHavilland 106 jet transport which will be powered by four engines."

He held out no hope for commercial feasibility of the Brabazon I, and termed it "an experiment in gigantism."

Board for Research Unit

Appointment of a 13-man board of directors for the Cornell Aeronautical Laboratory, Inc., has been announced by the University's board of trustees.

The board includes three representatives from the Buffalo area, three each from the Cornell administrative staff and board of trustees, and two each from the faculty and laboratory staff.

They are: Lewis G. Harriman, Buffalo, Patrick H. Hodgson, Buffalo, Paul Schoellkopf, Jr., Niagara Falls, President Edmund E. Day, Treasurer Lewis H. Durland, Secretary Robert B. Meigs, Cornell, Arthur H. Dean, New York, Victor Emanuel, Lawrence E. Gubb, Cornell Board of Trustees, Dean S. C. Hollister, Director W. R. Sears, Cornell, T. P. Wright and Dr. Clifford C. Furnas, president and executive vice president respectively of the laboratory.

Appointment of the board completes establishment of the laboratory as a separate corporation. It is no longer a subsidiary of the Research Foundation.

The facility capitalized at $4,500,000, employs some 600 persons in research for the government and the aviation industry.

Martin Gets New Order For Navy Attack Planes

Glenn L. Martin Co. has received an additional order for 50 model AM-1 Mauler attack planes, bringing to 149 the complete procurement commitment. Of this, about 30 Maulers already have been delivered.

The new Mauler incorporates a spoiler panel just inboard of the aileron and forward of the dive-brake-flap panels to correct a previous deficiency in the rate-of-roll of the aircraft. This slow roll resulted from heavy fuel and armament stowage in and under the wing.

While increased aileron area would have provided an ideal solution, this would have required extensive redesign of the outer wing panel. As a "quick fix" solution, Martin engineers installed a flat plate retractable panel which creates a spoiler action. It moves in unison with the adjacent aileron, spoiling the lift on the down-going wing and thereby increasing the rate-of-roll.

The new panel will be standard on the 50 new Maulers and is being installed on airplanes already delivered and returned to the Martin plant.

TWA Protests S & W Competition

TWA has protested to CAB against the competition given its international division by Seaboard & Western Airlines, New York.

The uncertificated operator, TWA declared, serves regularly more than half of the points in Europe certificated to TWA. Of 63 trips S&W reported operating across the Atlantic in the seven months ended Mar. 31, 46 served Geneva, Switzerland, and 24 stopped at Rome, according to TWA.

▶ **Rules Violated?**—Asserting that the frequency and regularity of S&W's DC-4 flights violate the "irregular" pattern established by CAB's nonscheduled exemption, TWA also contended that its competitor holds itself out to the public as a regular cargo service between New York and Geneva. TWA charged that Seaboard & Western has carried passengers to and from foreign points in violation of a CAB ban, that some of the uncertificated carrier's "contract" operations may not have been bona fide; that proper tariffs and reports have not been filed.

The certificated line requested the Board to institute an investigation of Seaboard & Western. If violations are found, TWA wants the smaller operator's letter of registration as an irregular carrier revoked.



POWER VS. PLANES

Proposed construction of 193 ft. high smokestacks, planned by Potomac Electric Power Co. at a new plant close to the south instrument approach to Washington National Airport, has created a serious problem in the Washington area. Air Transport Association attacked the construction as an airline hazard. City of Alexandria council voted against lowering the stacks. National Capitol Park and Planning Commission has refused permission for the power company to dig water conduits for the new plant until the aviation hazard question is settled. Photo shows the south runway approach at National Airport at right, and the site of the proposed plant at left.

INDUSTRY OBSERVER

► Air Force is examining the extraordinary range possibilities of the Northrop YB-35 Flying Wing equipped with the Pratt & Whitney R-4360 VDT engine, now under development. The variable discharge turbine assembly used in the Wasp Major project would reduce fuel consumption approximately to one-half that of conventional reciprocating engines. Jet-powered YB-49 continues to astonish observers with its spectacular rate-of-climb and 500 mph. top speed in level flight. Long-delayed phase II tests of three B-35 types at Muroc Air Force Base, Calif., are now well under way.

► British Boulton Paul Balliol is the first single engine plane to fly with a propjet engine. The RAF trainer is powered by an Armstrong Siddeley Mamba developing 1010 hp. plus 320 lb. static thrust.

► Al Williams is now flying the only privately owned Grumman F8F Bearcat in the world, a special "Gulfhawk," obtained through cooperation of Grumman and the Navy. The orange-and-white speedster will be used for stunt flying exhibitions and advertising around the country. The 52-year-old former Navy pilot is still one of the finest stunt pilots in the air and may appear at the National Air Races in September if Navy permission can be obtained. The Bearcat holds the world's climb record of 10,000 ft. in 100 sec., still unmatched by jet fighters.

► Navy is expected shortly to place a contract for Debmel (Curtiss-Wright) flight simulators that will duplicate the McDonnell FH-1 Phantom cockpit. These will be the first flight trainers for a jet plane.

► Final developmental distance measuring equipment (20 airborne units and 4 ground installations) is scheduled shortly for delivery to USAF by Federal Telecommunication Laboratories, Inc., (Nutley, N. J.) under an experimental program. This is follow-up on delivery (over period of about a year) of initial equipment (7 airborne and 3 ground installations) which was not built according to aircraft standards, and used only for trial purposes. Hazeltine Corp. is also building DME.

► Navy's supersonic wind tunnel, rebuilt from a facility captured at Kochel, Bavaria, is expected to start operation initially next month with first test results available in September. The huge vacuum sphere, twice the capacity of the original, was built entirely of American materials only the throat nozzles and balances being of original German design and construction. The tunnel is a part of Navy Bureau of Ordnance research facility at White Oaks, Md., on the outskirts of Washington, D. C., and will be used to develop fundamental data useful in the design of supersonic guided missiles.

► Production of the Curtis XP-87 all-weather fighter may be delayed indefinitely by a major design change in spite of the $1,500,000 tooling order already awarded the Columbus plant for its production. The four Westinghouse 24C engines will be removed and two General Electric J-47 (TG-190) engines substituted. This change will require construction of a new prototype, repeating phase I and II flight tests and new modifications and development work before quantity production can get underway.

► Fairchild Aircraft division has completed the last of its wartime contract for 200 model C-82 Packet transports and has already delivered the first of a new order for 20 additional airplanes. The delivery was accomplished in just 70 days from the award of the contract. Production line for the heavier, faster C-119 model is now being installed. The C-119 will follow the last of the C-82 off the line next October.

► A new schedule of fast Royal Canadian Air Force transport flights linking Canada from coast to coast has been inaugurated with DC-4M North Star aircraft on main runs from Goose Bay, Labrador, to Whitehorse, Yukon. Intermediate terminals are serviced by DC-3 Dakotas.

► Two new versions of the Breda-Zappatta 308, four engine Italian transport, are under consideration—one with a pressurized cabin for high altitude operations and another with large twin floats for use as a seaplane. The oversized floats would also be used for baggage storage.

No TWA President

TWA will operate without a president for the time being, at least. The carrier's board of directors adjourned a meeting in Kansas City late last month without naming a successor to LaMotte T. Cohu, whose resignation (AVIATION WEEK, May 10) became effective June 1.

Only important move announced by the board was the appointment of John A. Collings, vice president in charge of operations, to TWA's important executive committee, replacing Cohu. Other members of the committee are Warren Lee Pierson, board chairman, A. V. Leslie, vice president and treasurer, and Noah Dietrich, executive vice president of Hughes Tool Co.

AVIATION CALENDAR

June 6-11—SAE Summer Meeting. French Lick Springs Hotel, French Lick, Ind.

June 7—Fifth annual personal aircraft meeting. Institute of the Aeronautical Sciences, Rackham Memorial, Detroit.

June 8-10—Airport Management Conference. College Station, Tex.

June 9—Fifth annual personal aircraft meeting. Institute of the Aeronautical Sciences. Hotel Allis, Wichita.

June 10—Fifth annual personal aircraft meeting. Institute of the Aeronautical Sciences. Engineers Club, Dayton.

June 11-13—Spring Air Cruise sponsored by Pennsylvania Aviation Trades Association, Williamsport, Pa.

June 14-15—Airlines Medical Directors Association annual meeting. Royal York Hotel, Toronto.

June 16-18—19th annual meeting. Aero Medical Association. Royal York Hotel, Toronto.

June 16-18—Tenth annual Western Safety Conference. Hollywood Roosevelt Hotel, Los Angeles, Calif.

June 17-18—Aviation Distributors and Manufacturers Association. Grand Hotel, Mackinac Island, Mich.

June 21-25—American Standards Association seminar by Dr. John Gaillard. Engineering Societies Building, New York.

June 21-25—1948 annual meeting. American Society for Testing Materials, Detroit.

June 22-23—Annual Ohio State Aviation Clinic, Bowling Green.

June 23-26—Annual convention. National Aeronautic Association, Hotel Radison, Minneapolis, Minn.

June 30-July 11—National Soaring Contest, Elmira, N. Y.

July 2-9—Second National Air Tour Week. United Pilots and Mechanics Association.

July 4-8—Annual National Air Show, Port Columbus, Columbus, Ohio.

July 13—ICAO North Pacific regional meeting, Honolulu or Vancouver.

July 15-16—Institute of Aeronautical Sciences annual summer meeting and dinner. Hotel Ambassador, Los Angeles.

July 18-24—Airport construction equipment display. American Road Builders Association, Soldiers Field, Chicago.

July 17-18—National Trailing Day and All-Dixie Air Show. Chattanooga, Tenn.

July 18-31—International Sailplane contest. Samaden, Switzerland, open to U. S. contestants through National Aeronautic Association.

July 23—AIA Personal Aircraft Council Meeting. Detroit, Mich.

July 31-Aug. 8—International Air Exposition. New York International Airport (Idlewild), N. Y.

ENGINEERING & PRODUCTION

Teamsters Organizing at Boeing

New possibility for end of strike seen in jurisdictional claim and membership drive of powerful union.

The A. F. of L. Teamsters' Union is one of the strongest labor organizations in the Pacific Northwest, and its boss, Dave Beck, the most powerful labor leader on the West Coast. The union is noted for crossing picket lines when it has a contract with a strike bound concern. Its boss is noted for his ability in recent years to get along with management.

Last week those two facts took on new meaning in the strike of 14,800 Aeronautical Mechanics Union members against the Boeing Airplane Co. at Seattle.

• The Teamsters announced "we will accept in membership [illegible] all warehousemen, parts men, transportation department employes [illegible] and will represent them in the future."

• The Teamsters, according to the rival Aero Mechanics, have 12 organizers working on Boeing employes and already have signed up about 200 employes working in shops normally represented by the Mechanics.

► **New Peace Hope**—The number of Boeing employes and strikers eligible for membership in the Teamsters' Union is estimated to be only about 5000. But the Teamsters intervention is classed along with civic concern (AVIATION WEEK, May 31) as a prime hope of peace at the plant.

The Teamsters have not been observing the picket lines at Boeing. Neither have members of the engineers' union. In addition, the back to work move is growing. Total employment last week was put at near 5000 and was increasing 100 per day. Boeing claimed to have resumed limited work in 78 of its 80 shops.

The Teamsters reportedly have no intention of organizing the mechanics and production workers. But even restricted organizational efforts likely will have an important result on the eventual outcome of the strike, and on Boeing labor relations.

► **Teamsters' Position** — The company has insisted from the start that it can no longer rely on the Aero Mechanics leadership and has hinted that it wished to deal with a new union, one with "responsible" officials.

Dave Beck, at one time the Northwest's most hated and feared labor leader, in the past eight years has earned management's respect for his observance of contracts, his ability to keep his union in line and his fight against Communists. The reason given for the Teamsters' entrance in the Boeing strike picture highlights Beck's present role.

"Several thousand men and women, who properly belong to our organization, are today out of employment because of a labor dispute with which this union has no connection whatever [illegible] as a direct result of this dispute, a vast amount of work, upon which they have a right to depend in the future, has been transferred elsewhere and may never return to Seattle."

(This is the same fear motivating recent editorials in Seattle papers asking for settlement of the strike.)

► **Teamsters' Background**—The Teamsters started their organizational work on the basis of an old grant given them by A. F. of L. when the International Association of Machinists (parent body of the Aero Mechanics) also was affiliated with A. F. of L. IAM, however, never recognized the charter to the Teamsters.

Other union leaders in Seattle are split on the Teamsters' move. The secretary of the Seattle Central Labor Council approves, while most other leaders disapprove. Boeing is taking no position. President William M. Allen saying the employes must decide their own representatives.

While the union jurisdictional fight was brewing, first violence of the strike was reported. An Aero Mechanics member who had gone back to work and crossed the picket lines was beaten into unconsciousness as he left his home to go to the plant.

Lockheed Wage Raise

A blanket 5 cent per hour wage increase became effective at Lockheed on Memorial Day after acceptance by Local 727, International Association of Machinists, representing 9000 Lockheed workers (AVIATION WEEK, May 31).

Ivan Deach, Local 727 president, claims that "Lockheed now is the national leader in wage level with an average pay of $1.53 per hour." Under the new increase the company's maximum wage becomes $2.10 per hr., minimum $1.00.

Also newly in effect at Lockheed is a revision of job pay rate ranges. Union officials are confident that as a result the company within 60 days will begin retroactive compensation of workers who, due to confusion in the interpretation of job classification rates, failed to benefit from last year's 3 cent and 2 cent pay boosts.

The new 5 cent blanket wage increase represents a pay boost of approximately $1,000,000 a year to Lockheed production employees.

Aviation Officials Buy Own Shares

A marked increase in security trades by aviation officials is evident in the recent reports released by the Securities and Exchange Commission. The trend is toward acquisition of their own shares by "insiders". However, a few noteworthy outside sales are also in evidence.

► **Buys Lockheed**—Following the purchase of 1000 shares of Lockheed in January, Cyril Chappellet (vice president) bought 300 more in February to bring his total holdings to 7454 shares.

A belated report revealed the purchase of 500 shares of Eastern Air Lines by P. E. Reinhold in December, 1947, representing his entire holdings in the company.

► **Continuous Selling**—Among the significant transactions was the continuous selling by Alonzo Pettevs of his common preferred stock holdings in Northwest Airlines. A total of 1100 shares of common were sold in January, followed by the liquidation of 11,900 additional shares in February, leaving net holdings of 25175. His entire holdings of 2000 shares of preferred also were sold in January. A preliminary report previously indicated that E. I. Whyatt had disposed of his entire holdings of common stock as well.

During December, 1947, G. W. Gibbs, Jr. sold 2600 shares of National Airlines, leaving a balance of 60. A month later, H. C. Dobbs purchased 100 shares bringing his holdings up to 200 shares.

► **Alaska Airlines Shares**—In a series of trades, starting in August, 1947, and continuing through January, 1948, J. A. Wooten acquired a total of 7000 shares of Alaska Airlines.

During February, 1000 Republic shares were purchased by J. W. Powell, boosting his holdings to 3000 shares. In the same month, G. H. Shaw acquired 200 shares of Consolidated Vultee Aircraft.

Personnel Changes At Bell Aircraft

Following the resignation of Robert M. Stanley, vice president in charge of engineering at Bell Aircraft Corp., Roy J. Sandstrom was promoted to executive chief engineer chief engineer and John F. Strickler assistant executive chief engineer.

Sandstrom, who joined Bell in 1938, was formerly with Curtiss-Wright Corp., Airplane division and recently served as chief of technical services in charge of Bell's military engineering work.

Strickler, former Air Force lieutenant, has been with Bell since 1936. Before receiving his promotion, he was assistant chief engineer at the company. Both men are graduate aeronautical engineers and members of the Institute of the Aeronautical Sciences.

In other personnel developments:

• **Glenn L. Martin Co.** elected Joseph C. Lillis a member of the board of directors and secretary of the company, to succeed the late Thomas H. Jones who had been associated with the Martin Co. since 1910. The new officer, who is a specialist on corporation law, is with the firm of Jones Day Cockley & Reavis in Cleveland.

• **Aeroncon Aircraft Corp.** announces the resignation of Sidney F. Brody, vice president, effective June 10. He will remain a director of the corporation.

• **Lockheed Aircraft Corp.** elected Theodore S. Rellman assistant treasurer to succeed the late Ronald P. King. In addition to his Lockheed responsibilities, Rellman is a director and member of the executive committee of the Pacific Finance Corp.

• **Lockheed Aircraft Service Inc.** appointed Mark T. Wood, vice president and Burbank base manager. He succeeds Col. Luke Reccio who resigned to return to active duty with the Air Force.

• **Hughes Aircraft Co.** named Dr. Simon Ramo formerly of General Electric director of guided missile development. Ramo has also been appointed research associate of the California Institute of Technology where he teaches an advanced course in radio engineering theory.

• **Bendix Aviation Corp.** announces that Donald T. Brady has resumed his duties as hydraulic sales engineer of its Pacific division. Brady was away on leave for the past year.

• **Sale Flight Instrument Corp.** appointed Marvin Wildman former Air Force flight instructor- sales manager.

• **Tinnerman Products Inc.** elected George J. Schad treasurer and director. Schad who has been with Tinnerman for 16 years was assistant treasurer and comptroller.

• **Vic Precision Industries, Inc.**—appointed Charles Beard general sales manager. Beard was formerly with Douglas Aircraft Corp., originally in production control at the El Segundo plant then as liaison representative of the company's wartime service and maintenance base in Africa.

• **Jack & Heintz Precision Industries, Inc.**—named Alfred N. Lawrence sales manager of its aviation division. At the same time it was announced that Dwain E. Fells had joined the development engineering staff.

• **Vapor Heating Corp.**—appointed Wirt Pacley Jr. manager of the San Francisco office. A. P. Slikkers formerly of the San Francisco office was transferred to Los Angeles as district engineer.

• **Avco Manufacturing Corp.** elected Raymond C. Cosgrove and Cael H. Kindl executive vice president of the company. Cosgrove will be group executive of the Cooley American Central and New Idea divisions.

BRIEFING PRODUCTION NEWS

▶ **National Requirements Service** has been organized at Dayton, Ohio, to act as local representative for manufacturers dealing with Wright Field. Headed by William W. Bentley, jr., it has headquarters at 1308 Mutual Home Building. An aeronautical engineer, Bentley formerly worked at the Field. Purpose of his firm is to assist manufacturers whose circumstances do not require or permit full-time representatives at Dayton. Present clients include Ford Instrument Co. and Communication Measurement Laboratory.

▶ **Cessna Aircraft Co.** has received a third contract from the Army Quartermaster Corps for the construction of $3,500,000 worth of furniture for Army posts. Approximately 86,000 pieces of composite wood-metal furniture, consisting of an aluminum frame covered with walnut veneered plywood panels are called for in the contract.

▶ **Gilfillan Brothers, Inc.**, Los Angeles, will add 500 new engineers and electronic technicians to fulfill the $11,000,000 contract for GCA radar landing aid equipment received from the Civil Aeronautics Administration and USAF.

▶ **Bell Aircraft Corp.** production of mechanical wheelbarrows is steadily increasing but orders continue to run between 400 and 500 ahead of deliveries.

▶ **Pacific Airmotive Corp.** has purchased Accessories Manufacturing and Engineering Co., manufacturers of the AMECO line of cabin pressurization controls used on 22 different airplanes.

▶ **North American Aviation** is reconditioning 30 AT-6 trainers for the Argentine Navy. The trainers will be purchased from surplus, overhauled, and flight tested before delivery. The work is being done in the former Vultee plant at Downey, Calif.

▶ **Glenn L. Martin Co.** was awarded the first production certificate by CAA authorizing the company to assume responsibility for inspection and individual certification of production model 2-0-2 transports.

▶ **United Helicopters, Inc.** has opened its new East Palo Alto, Calif. plant which contains 36,000 sq. ft. and will permit delivery of two ships per day when full production is attained. First output will be a limited quantity of the three-place, 178 hp. Model 360 design.

▶ **Bendix Aviation Corp.** has consolidated all of its West Coast service facilities into a single organization located at 117 East Providencia, Burbank, Calif. The new unit is known as Bendix West Coast and is completely equipped to service all products of the Eclipse-Pioneer Division, Bendix Products and Scintilla Magneto Division. The new office and shop building contains 10,000 sq. ft. of floor space and installed equipment represents a total investment of $250,000.

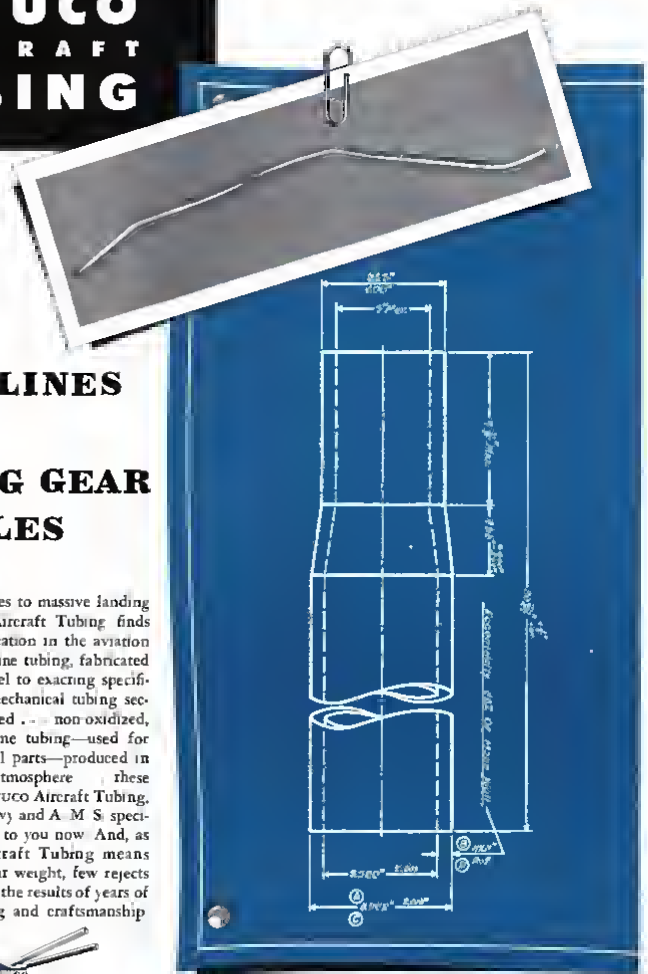
▶ **A. O. Smith Corp.**, Milwaukee, is fabricating welded hollow and steel propeller blades under a development contract with the Propeller Division of Curtiss-Wright Corp. New facilities are being added in preparation for quantity production of the new blades, which are for use on the Convair B-36A.

▶ **Boeing Wichita** division employment has climbed from 1515 in March to about 4000. Call has been issued for 1000 additional personnel. The plant eventually will employ between 6000 and 7000 with the peak goal set for Aug. 1. Wichita division backlog has increased "tremendously" in the past 60 days necessitating the eventual use of the entire plant 2 facilities at Wichita.

▶ **General Electric** aircraft gas turbine divisions at Lynn and Everett, Mass. represent an investment of $25,000,000 devoted to the development, testing and production of jet engines and aircraft superchargers, one of the largest such facilities in the world. Since V-J Day, GE has invested $11,000,000 in new facilities including a huge new test laboratory for jet engine components. GE now leases government-owned facilities worth $14,000,000.

▶ **McDonnell Aircraft Corp.** is completing its assembly line tooling for F2H-1 Banshee production, which is expected to increase employment to 6000 by next spring. The airplane has been designed in a larger number of assemblies than the FH-1 and therefore is more suitable for quantity production. A major change is in the fuselage assemblies, which are bolted together, replacing the integral design of the FH-1 fuselage. Current McDonnell backlog is approximately $40 million with stepped up production expected under the fiscal 1949 Navy procurement program.

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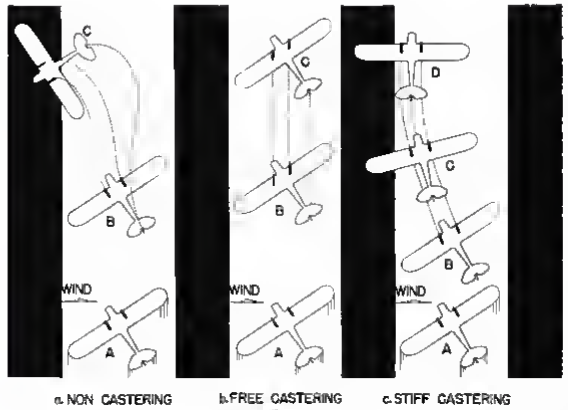
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a. NON CASTERING b. FREE CASTERING c. STIFF CASTERING

Fig 1

Why Cross-Wind Landing Gear?

Development, purpose and functioning of castered wheels on aircraft discussed by project engineer.

By O. W. Loudenslager*

When an airplane makes a cross-wind landing, it must maintain an angle of drift to hold a course in line with the runway

If, under these conditions, the wheels contact the ground, they will skid sidewise and resulting forces may be sufficient to damage the landing gear or cause a serious ground loop (Fig 1aC)

▶**Conventional Hazard**—Every fledgling pilot is taught to make cross-wind landings by using the rudder to align the plane's axis with the course a moment before touch-down, or by depressing a wing so that the craft will sideslip into the wind at a velocity equal to the cross-wind component, thus keeping the heading of the plane in line with its course

These methods require expert handling and split-second judgment if they are to be executed successfully. The operation is sufficiently hazardous so that many millions of dollars have been spent for multi-landing strip airports to avoid it

Purpose of the cross-wind landing gear is to permit the wheels to be turned manually or automatically into alignment with the plane's course so pilot need not make the correction mentioned, thus reducing side forces to a safe value (Fig 1b)

▶**Early Cross-Wind Development**—About 1908 or '09, Louis Bleriot invented a castering arrangement which avoided the difficulty of side forces causing wheel failure. This was probably the first cross wind landing gear. The plane in which he made his historic first flight across the English Channel on July 25, 1909, was equipped with his device

Other designers at that time solved the problem by providing skids intended to support the plane in event of wheel failure. It also was discovered that with design modification it was possible to use the skids for brakes to stop the airplane after landing

Bleriot's gear had no brakes. It is reasonable to suppose that this fact, together with other minor difficulties encountered, was responsible for his abandoning the idea in 1912 in favor of stronger wheels with wider hubs

▶**Interim Status**—During the next decade or two, most flying was done with small planes having low landing speeds. Cross-wind gears were not needed badly because operations frequently were based on race tracks, pastures, baseball parks, etc., so that into the wind landings usually could be made

When faster and heavier airplanes required paved strips, the picture changed again. Where terrain and financial considerations permitted, several strips running in different directions were built to avoid cross wind landings to the greatest possible extent. However, airport construction did not keep pace with the increase in private flying and weight and landing speed of modern planes, hence the necessity for cross wind gears once more appeared.

▶**CAA Enters Picture**—The tricycle landing gear, also originated in the early days of the airplane, was re-introduced in the 1930's, partly as an aid to cross-wind landings. In 1938, Owen F. Maclaren installed a crosswind gear on an Arpin monoplane in England, all three wheels being steerable. The pilot had to estimate his drift and set the wheels accordingly before landing.

In 1945 Congress appropriated $150,000 to enable the Civil Aeronautics Administration to sponsor cross-wind landing gear development. CAA specified that the gears should be completely automatic and require no cockpit controls.

A number of American manufacturers contracted with CAA, and in May, '46, the Goodyear Aircraft Corp. agreed to develop a castering wheel for high wing lightplanes. The castering wheel was chosen because the usual landing gear design of such craft made castering outside of the wheel impractical.

After this contract was completed in '47, Goodyear entered into a second contract to develop a castering wheel for a DC-3, to determine practicability of cross wind gear on heavy planes.

Results achieved encouraged the company to make an appropriation far in excess of the total amount of the contracts, to carry on additional cross-wind gear development.

▶**Goodyear Gear Details**—Various aspects of the resulting Goodyear cross-wind landing wheel is shown in Figs 2, 3, and 4

Fig. 2 depicts the inboard side of the assembled wheel

Fig. 3 shows the wheel, with tire, inboard wheel half, and other parts removed. The three upper views (gear V-strut removed) show the wheel in mid-position and in extreme right and left caster. Brake disk with notches for



Fig. 2

* Assistant Manager, Research and Development, Goodyear Aircraft Corp.

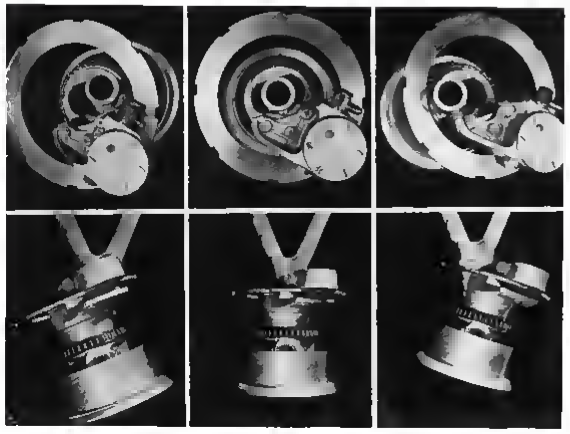


Fig 3



Fig 4

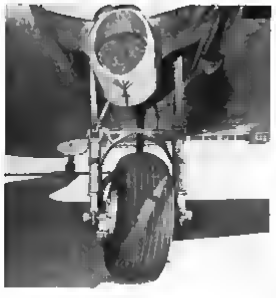


Fig 5

the keys by which it is driven, and the hydraulic brake cylinder together with hose fitting are also shown.

Corresponding lower views are looking up from below the wheel, and show the V-strut in place on the axle. One of the two tapered roller bearings is seen on the hub.

Fig. 4 is a stroboscopic photo showing how the wheel pivots.

▶ **Cam Action**—The king pin passes through the wheel center so that brake application cannot make the wheel caster. When mounted on a plane, the king pin is inclined with its lower end forward so the wheel will caster automatically when the craft is in any possible flying or taxiing attitude.

The entire weight of the plane rests on a cam which is visible on the lower side of the axle in the upper views of Fig. 3. This cam has been designed to give the wheel maximum possible freedom to caster. A small depression in the middle of the cam provides a slight extra resistance to castering out of mid-position. This extra resistance keeps the wheels parallel when the plane is pushed backwards and when taxied at low speeds. A spring (not shown) working with the cam, centers the wheels when the plane is airborne.

▶ **Shimmy Factors**—Reliable shimmy dampening is necessary. Since main wheels are involved, severe shimmy could result in a serious accident. The cross wind wheels were designed so that friction resulting from the weight of the plane on the cam is utilized. Even in the best possible lubricated condition, this friction is adequate, hence, neither faulty maintenance nor failure of the parts can cause a serious shimmy.

Experience has indicated that slight shimmy can develop under certain very lightly loaded conditions of the wheel. Tests have shown that this shimmy is not sufficiently violent to be serious, but it is considered undesirable, and an additional spring loaded shimmy dampener device has been provided to eliminate it.

▶ **Centering Torque Analyzed**—Some cross-wind gears have been built with excessive centering torque. Theory underlying such designs is that they are merely to provide elasticity which will relieve the gear of some of the side forces resulting from a cross-wind landing, and that they will center as soon as the wheels make firm contact with the runway.

Although such gears will give greater freedom from ground loop than non-castering gears, increased tire wear is to be expected. They will also have somewhat undesirable landing characteristics as shown in Fig. 1c. When a plane, so equipped, is landing with an angle of drift, stiffness of such a gear causes the tires to skid sidewise during the touchdown period (Fig. 1cB). After firm contact with the runway, the wheels straighten and the plane starts to head off the runway (Fig. 1cC), and pilot must straighten it out to stay on the runway (Fig. 1cD).

With Goodyear cross-wind wheels, the complete freedom to caster enables the plane to maintain its angle of drift after contact with the runway (Figs. 1bB and C).

▶ **Craft Applications**—Type Certificate No. 179 has been issued for the Goodyear 6.00×6 cross-wind wheel—the only such gear now in production. It is certificated for installation on a Stinson Voyager, Cessna Models 120, 140, and 170, Piper Cub J3, and Goodyear Aircraft GA-2 amphibian.

Proceedings are under way to certificate these wheels for use on a number of other light planes. A 6.50×8 wheel being developed will soon be test flown on a Beech Bonanza. The 17.00×16 wheel (Fig. 5) used on the DC-3 is also going through type certification proceedings.

Experience with these installations has shown that they can be used advantageously on planes of any size or type where clearance for castering can be provided, and work equally well on light and heavy planes and on tricycle or tail wheel types.

Although properly designed cross-wind gears which caster in the strut will be entirely satisfactory in some instances, the Goodyear landing wheel is believed to be the most convenient solution to the problem of installing cross-wind gears on planes using multiple landing gear struts (common on many heavy airplanes), off center struts (frequently used on low wing lightplanes), and the usual V-type or spring type struts to be found on high-wing lightplanes.

Cross-wind landing wheels also offer a decided advantage on heavy planes



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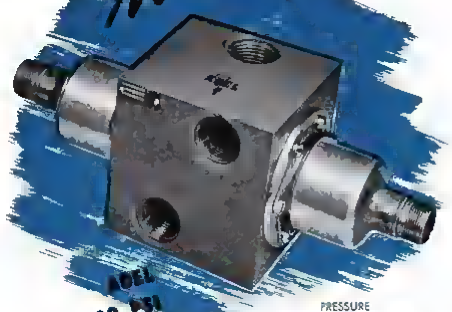
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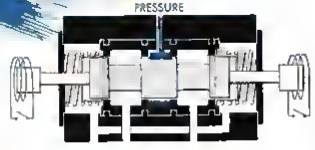
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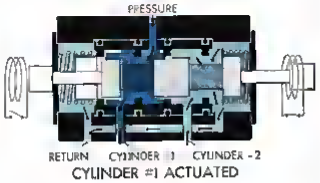
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using multiple landing wheels. One advantage of the multiple wheel design is that quite safe landings can be made with one tire deflated. However, if such a gear were castered in the strut, a blowout could be quite serious because brake application would tend to swivel the group of wheels. If all of the wheels in the group were cross-wind wheels, the castering feature could be obtained without sacrificing safety in event of a blowout.

▶ **Airfield Considerations**—In wartime, when advance air force units normally have only one fairly good landing strip, cross wind landing gears should prove a great aid. And coupled with this is reduction in maintenance to keep the equipment available for military operations.

It is also felt that personal plane owners will be attracted by the possibility of using landing strips closer to home and destination, by the increased safety, and by the saving in costly landing accident repairs.

Instructors claim that they can teach a student to fly in less time with planes which are equipped with cross-wind landing gear.

Now that it has been demonstrated that cross-wind landing gears can be used successfully on heavy airplanes, the potentialities of such commercial installations obviously should not be overlooked.

Many multi-landing strip airports have only one strip long enough and sufficiently free from obstructions to be safe for use by heavy, fast, modern planes. Hence, the CAB has permitted airline operators to stop rendering service at many such airports.

As a result, newer ports, still farther from the centers of population are being built to accommodate modern airliners. This is not only a very costly procedure, but it also makes air travel less convenient.

The general use of cross-wind landing gears on heavy airplanes should improve this situation considerably.

As a result of the present airport situation, many cross wind landings have to be made. Experienced airline pilots frequently jolt their passengers severely during this operation. This creates important safety considerations, as well as problems concerned with landing gear maintenance.

Figures compiled from the CAA Statistical Handbook of Civil Aviation, published in 1945, show that practically two-thirds of all domestic air carrier accidents during the five-year period from 1940 to 1944 inclusive, occurred during taxiing, takeoff, or landing. The general use of cross wind gears on transport airplanes should result in considerable improvement in this record, thus not only improving safety, but reducing cost of operation.

Atomic Rocket

Briton proposes design in which fuel tanks are expendable.

A novel approach to space-flight via an expendable tank step rocket utilizing atomic energy has been outlined by Kenneth W. Gatland, Fellow of the British Interplanetary Society.

According to Gatland, it appears that application of atomic energy for the propulsion of man-carrying rockets would be in a form of high-temperature pile to heat a working fluid which could be expanded through a nozzle.

The nuclear reactor would supply heat energy to the fluid just as chemical reaction does in present rockets.

▶ **Rocket Factors**—Using a working fluid such as liquid hydrogen, Gatland holds that an exhaust velocity double that of present oxygen alcohol rockets might be achieved without incurring restrictive chamber temperatures. The method, however, would be applicable only in large rockets which might have a gross weight of some 1000 to 1500 tons.

This implies, says Gatland, that despite atomic energy, such a rocket still would be composed 80 to 90 percent of stored propellant. Second in consideration of weight would be the reactor itself and shielding against lethal radiation emitted.

The rocket would require the same careful attention to the elimination of dead-mass of structure as has always been observed in theoretical conceptions based on chemical reactions, especially in regard to rockets for escaping from the earth.

▶ **Step Arrangement**—The step method of construction in which the rocket is composed of several sections, each having separate motor and propellant, which fire successively and jettison when expended, has often been advanced as a means of improving performance, for these main reasons: Deadweight is reduced by jettisoning spent sections; each section starts with the velocity attained by the impulse of the preceding sections; and each new section fires at an improved altitude, gaining progressively better operating efficiency.

However, since the weight of propulsor and shielding in atomic rockets would be prohibitive in the normal step arrangement, Gatland advances a method of construction in which there is one motor deriving its power from propellant in expendable tanks.

He illustrates his conception on the basis of a piloted circumnavigation of the moon.

▶ **Rocket Makeup**—The rocket conceived is a five-step arrangement in which the single propulsor uses propellant drawn from tank sections which expend successively back from the nose.

To achieve release of the steps, and to stimulate an artificial gravity by centrifugal force the complete craft would be caused to rotate about its longitudinal axis. The crew would be disposed radially in their pressurized chamber, seated in adjustable chairs facing outboard, from which they could take control in turn.

Rotation at the rate of one revolution in three seconds would approximate gravity conditions at the earth's surface, without it, the crew would experience "weightlessness" after propulsion thrust ceased. The chairs would be convertible so that the men could lie prone during off-duty periods.

It is held likely that a large part of the flight would be automatic and partly telecontrolled by signals from the earth.

A device known as a strobo periscope (claimed as a development of B.I.S. technicians R. A. Smith and H. E. Ross) would give stationary external vision from the rotating cabin.

▶ **Expendable Tanks Featured**—Propellant for gaining release from the earth would be drawn off from the tank in the final stage above the propulsor, into which propellant from the first three tank steps is automatically transferred (preferably undergoing at the same time a process of re-liquefaction) so that the fourth tank step and the final stage achieve release velocity (7 mi. per sec.) at capacity level.

Using an acceleration of 2Gs, it is claimed that release would be achieved after 7¼ min. thrust, when the craft would coast under momentum, though at slowly decreasing speed, out of the earth's gravitational influence.

As the tank steps are emptied, the two separate bays in each divide, and are thrown off by centrifugal force. Because of build-up of air pressure, split flaps opening on the hull or, possibly, the firing of a small charge, might be necessary to assist separation of the step. Propellant in the fourth tank step would be used for control and to return the craft to earth.

▶ **Flight Details**—The craft would be taken into an orbit around the moon where it could remain circling until thrust was again applied to accelerate it back into the earth's gravitational influence.

Remaining propellant would be used in reverse thrust motors to brake the craft's speed sufficiently for it to reenter the atmosphere safely, where the crew chamber would be released and returned to the surface by parachute.

Parachutes also would be necessary to land the tank sections. After the crew had left, the final stage would be directed into the sea remotely from the ground.

Gatland advances his idea as an abstract impression, based on present available knowledge, of a possible development which may arise within 20 to 50 years, according to intensity of effort put into the work.



HELICOPTER DESIGNED TO FLY LIKE PUSHER PLANE

This coaxial copter configuration proposed by Daniel R. Zuck, Los Angeles, features rotors of unequal diameters and 90-deg. swing tail rotor. For high speed condition (top) large rotor is feathered, small rotor free-wheels, and maximum available thrust is applied at tail prop. For maximum lift and dead stick landing (bottom), large rotor is unfeathered and maximum available power applied to direct lifting rotors. Tail prop is swung to side, counteracting unbalanced torque from the unequal rotors.

Dorsal Fin: Aids Stability, But How?

Extension of vertical stabilizer is in widespread use although all of its actions are not yet understood.

By Robert McLarren

The dorsal fin, a low, long extension of the vertical stabilizer forward along the fuselage, gained such widespread use during the war—and extended in peacetime—that it has become almost a standard part of the modern plane.

Despite these thousands of installations, however, its basic design parameters are generally still not clearly understood, and much research remains to be done before its characteristics can be predicted accurately.

► **Fin History**—The dorsal fin is a comparatively new addition to standard airplane configuration. Its first use for stability purposes on a production airplane was the Douglas DC-3 of 1936. First extensive use was on the Boeing 307 Stratoliner of 1940. Its effectiveness on multi-engine aircraft expanded this early use, and ultimate employment on highly maneuverable single-engine, single-tail combat planes assured its permanence as an aeronautical fixture.

► **Vertical Surface Action**—The conventional fin-and-rudder combination comprise a variable camber airfoil capable of generating varying quantities of lift (in the airplane horizontal reference plane) to meet the needs of directional stability and control of the craft. Because it is an airfoil, however, it exhibits conventional airfoil stalling at an angle of attack of 15-20 deg. Hence, when an airplane gets into a sideslip or is yawed to this magnitude, the vertical tail surfaces stall and their effectiveness is lost.

This situation produces what is known as rudder lock or rudder reversal, a change in sign of the rudder hinge moment which requires a considerable amount of pedal force to move the rudder back to neutral to force the airplane back to steady, level flight. If this force is greater than pilot's strength (180 lb of force on the rudder pedals),[3] a rapid rotation in yaw accompanied by a rolling motion results, and the airplane may be well into a spin.[4]

► **Stall Causes**—Vertical tail surface stalling can result from:

- Asymmetric power—single or multi-engine failure on a multi-engine aircraft in which one or more engines remain operative—at low speeds of an airplane on which the rudder is either incapable of supplying all the required restoring moment or its action is delayed by pilot.
- Inadvertent excessive sideslipping of a highly maneuverable airplane.
- Intentional excessive sideslipping for experimental or instructional purposes.[5]

It is apparent that large airplanes are infrequently yawed to any appreciable extent in routine operation, and even deliberate sideslips to cut final approach speed or angle of descent rarely exceed a few degrees.

The failure of a power plant on a twin-engine fighter or transport, or of one, two or even three engines on a four-engine bomber or transport, is a possibility to which the designer must devote considerable attention.

The yawing moment due to yaw is only a portion of the total yawing moment that can be developed in a sideslip or yawed flight. For example, in the event of a multi-engine failure, the loss of power requires the pilot to nose the airplane down to maintain flying speed. As the yaw increases the drag of the airplane, the nose must be dropped still further. If the airplane is flying slowly at the time of the engine failure, the reduction in maximum lift coefficient with angle of yaw may stall the craft.

The yaw itself produces stalling moments and since most airplanes have very little longitudinal stability near the stall, these stalling moments due to yaw are likely to stall the aircraft unless the pilot reacts quickly. However, he can only counteract these moments by reference to his airspeed indicator, since the attitude of the airplane is changing rapidly. An attempt to correct the situation by judging the attitude of the airplane at this point usually results in his attempting to hold the nose up to the horizon, which is certain to create a stall.

► **Wing Dihedral Effect**—As the airplane yaws, the dihedral effect of the wing creates a rolling moment, which must be counteracted by the ailerons. Again, however, the adverse yawing effect of the ailerons will tend to further increase the yaw.

Still other factors tending to further increase the yaw are the drag of the windmilling engine, thrust of the operative engine, additional lift generated on the wing behind the operative engine, and effect of the continuing decrease in speed.

From this it is apparent that (1) Large angles of yaw should be avoided and (2) means should be provided for the creation of large yawing moments tending to restore the airplane to steady flight.

► **Dorsal Fin Advantages**—Most effective method of providing such forces is the dorsal fin. Research indicates that a dorsal fin can increase the effectiveness of the vertical tail surfaces by important amounts.[4,5] Whereas the tail without dorsal fin attached to a fuselage loses its effectiveness at 10-15 deg, addition of the fin extends this effectiveness to 30-50 deg.

It is this extension of the stalling angle of the vertical surfaces that is the dorsal fin's principal area of usefulness, for repeated wind tunnel tests and millions of hours of flight tests have proved that the addition of a dorsal fin has no effect whatsoever on directional stability at angles of yaw of less than about 10 deg.

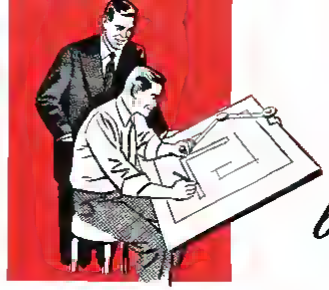
► **Data Empenical**—The action of a dorsal fin in providing this significant aid to directional stability is not clearly understood, although enough empenical data are available to permit preliminary design, subject to wind tunnel and flight test modifications. Some of the factors involved, however, are well known. Since a fuselage has its center of pressure well forward of its center of gravity it is unstable, and the addition of lateral area aft of the C.G. produces a restoring force to disturbances. It has the effect of flattening out the rear of round fuselages in a vertical plane.

Another effect, which is not yet thoroughly understood, is the action of the dorsal fin in disturbing the flow over the downwind side of the yawed airplane and thereby reducing the negative pressure in that region. However, wind tunnel tests have not yet fully supported this theory. It is due to this lack of a rigorous theory that dorsal fin design is largely empenical to date.

Generally, designers simply shape the dorsal fin to the individual configuration of the fuselage tail juncture based on previous experience, and rely largely on wind tunnel and flight tests to determine the proper shape, area, and area distribution required by the individual design.

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1. L-M Medium-Intensity Elevated Runway Lights—for smaller airports and for secondary runways and taxiways at largest fields. Three brightness stages. Various mountings available.

2. L-M-Bartow High-Intensity Elevated Runway Lights both fixed and movable beam types, 200 and 500 watts, the latter giving up to 200,000 beam candle power.

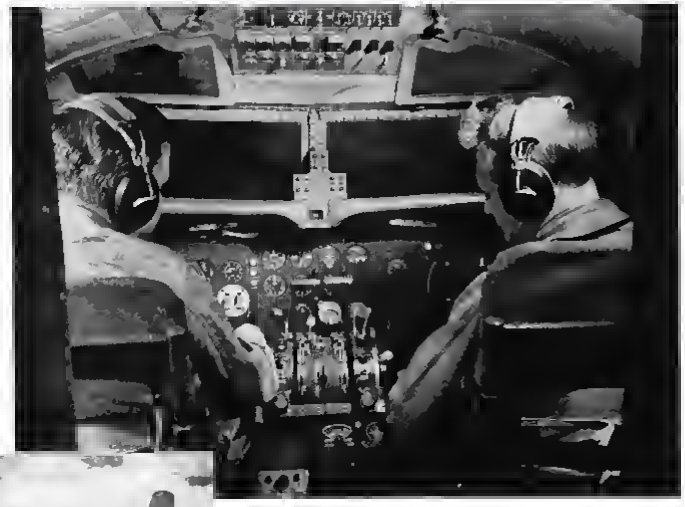
3. L-M Power and Control Units: Several types provide brightness control, simple beam focusing switch, beacon switch, indicator lights, transformer, circuit breakers, fuses, etc.

4. L-M Rotating Beacon for Class 1, 2, and 3 airports. Light, efficient, completely sealed, with no external moving parts. White and green beams plus ceiling height indicator. Up to 400,000 beam candlepower. **L-M-Bartow 36" Rotating Beacon** for class 3 to 7 airports. Two 24" bull's-eye lenses for main beam, clear, or in colors as required. 20 degree sweep beams. **Both beacons** have automatic switching to spare lamps, and latitude indicator on control panel if lamp burns out.

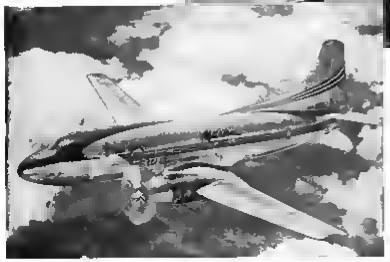
5. Marker and Obstruction Lights: has many features of the medium intensity elevated runway lights, permitting economical parts interchange. With or without transformer and mounting bracket; red fresnel lens.

6. Other Equipment: Transformers, fuse cutouts, cable and all other electrical equipment required, including L-M's ingenious cable splice kit which greatly simplifies splicing of two, three or four cables. Complete Airport Lighting Engineering Service.

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• **REAL PILOT COMFORT!** Completely adjustable seats, adjustable rudder pedals. All controls located forward and within easy reach of pilots . . . control handles identified by different shapes and colors . . . emergency controls overhead and accessible to both . . . heated, double-paned, bird-proof windshield.



• **PERFORMANCE PLUS!** The Martin 2-0-2 boasts unusual stability in flight . . . cruises at 100 m.p.h. faster than the twin-engine planes it replaces, at full gross weight of 39,900 pounds . . . can climb 1410 ft. per minute . . . has service ceiling of 25,900 ft. . . . owes much of its high performance to new, efficient Martin wing, flaps, ailerons. Unusual ground maneuverability is possible through steerable nose wheel.



• **PLEASES PILOTS!** Martin 2-0-2 can take off at full gross weight, over 50 ft. obstacle, in 2230 ft. Unusually wide center of gravity range eliminates loading problems. Mareng flexible fuel tanks, located outboard of engines and away from cabin, help minimize mental hazard. Exceptional stability and control characteristics make 2-0-2 easy to fly . . . require minimum effort on pilot's part with maximum response.

Easy-to-Fly Martin 2-0-2 Designed for Pilot Satisfaction

UNUSUAL cockpit convenience, visibility and comfort, plus superior flying characteristics, make the Martin 2-0-2 the easiest aircraft of its type to handle. In mockup stages, Martin pilots worked with design engineers. Then experienced airline pilots inspected cockpit and made suggestions. Result: a cockpit *for* pilots, designed *by* pilots.

Pilot advantages of the 2-0-2 include beat anticing for wing, rail surfaces and propellers . . . quick, easy emergency gear extension, securely locked by gravity and airload . . . new Martin positive-control gust lock, instantly engaged on ground, simply released, providing complete safeguard against taking off with locked controls.

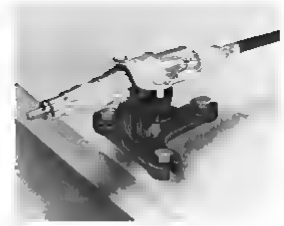
Pilot fatigue is reduced by efficient arrangement of cockpit controls and instruments. With this simple, logical arrangement, first things come first, giving a natural sequence of movements that minimize fatigue. Pilot may thus conserve energy for in-flight periods when maximum alertness is required. The Glenn L. Martin Company, Baltimore 3, Md.

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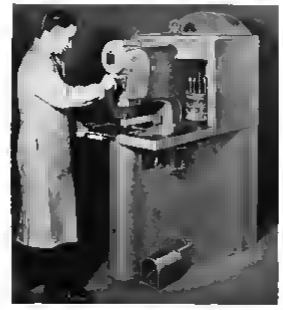
Vibration-Control Mounting

To reduce vibration in production machinery and equipment is new "Chan-L-Mount" offered by **Lord Manufacturing Co.**, Erie, Pa. Mounting is 1½ in. high and is installed by sliding under machine. Bolt head is inserted in either end of metal channel, which holds it while nut is tightened. Heavy cushion of soft rubber prevents metal-to-metal bottoming. Claimed is ¾ in. deflection enabling unit to isolate frequencies as low as 600 cpm.



Sheet Metal Fabricator

Applicable to production phases of aviation is new sheet metal fabricator which punches, notches, nibbles, bends forms, and blanks. Maker is **Wales-Strippit Corp.**, North Tonawanda, N. Y. Self-contained holder is slidable, and punches and dies are quickly interchangeable. Three dies of various clearances are provided for each punch to accommodate material up to ⅜ in. thick. Special extended and adjustable holder with manual turning device swings work at center for nibbling out full circles, semi-circles, and arcs.

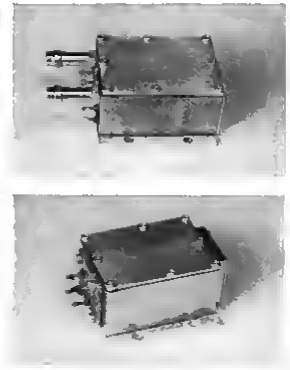


Tubular Capacitors

Aimed at minimizing component failures in radio-electronic assemblies, are paper tubular capacitors featuring new impregnant and casing materials. Units are encased in company-developed plastic intended to provide permanent, non-varying, hard casing fitted to imbedded section and pigtail leads. Voids, fissures and loose fits are claimed as precluded by special casing process. Maker is **Aerovox Corp.**, New Bedford, Mass.

For Portable Tools

New portable tool mounting fixture, Model 7101—designed to facilitate grinding, burring, drilling and reaming jobs, screw-driving and nut settings, rotary file work, and other production jobs—is made by **Aro Equipment Corp.**, Bryan, Ohio. Adjustable device is applicable to jobs where it is more practical to bring assembly to tool. Fixture accommodates tools from small size drills, grinders, screw drivers, etc., to ½ in. drill, and electric tools.

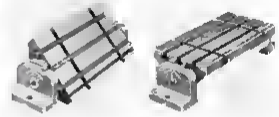


Pick-up Instruments

New line of miniature "Teleflight" accelerometers and pressure transmitters is offered by **Fredric Flader, Inc.**, 583 Division St., North Tonawanda, N. Y. Pressure instrument (top photo) ranges are up to 50 psi., weight is approximately 4 oz. Devices may be used to measure either differential or gage pressures. Accelerometer (above) range is up to ± 200 Gs. Weights are from 4 to 9 oz. Units are fluid damped to 65 percent of critical through use of an organo-silicon.

For Die-Forming

Aluminum bronze alloy, Ampco 24, engineered for use in forming and drawing dies, is made by **Ampco Metal, Inc.**, 1745 S. Thirty-Eighth St., Milwaukee, Wisc. Claimed is that new alloy is hard, strong, and wear-resistant, and that sliding action of dissimilar metal over its surface causes less friction and wear.



Work Table

Designed to make milling machine a more flexible tool, "Universal" work table enables operator to tilt work from 0-45 deg. in either direction and lock it at desired angle. Calibrations on dial at end of table permits operator to change position of work and return it accurately to previous position or to select new one without removing work from table. Maker is **Malnar Machine & Tool Co.**, 19301 St. Clair Ave., Cleveland, Ohio.

Information Tips

Specialized Cleaning Processes

New 26-page manual on aircraft cleaning issued by **Turco Products, Inc.**, Los Angeles, Calif., gives how-to do-it information for airline maintenance activities. Included is description of methods, materials and equipment used for plane exterior and interior, engine overhaul and special operations, paint shop procedures, and building, grounds and hangar maintenance.

Welding Data

Of interest to production and design engineers, instructors and students is folder offered by **Air Reduction Sales Co.**, 60 E. 42 St., N. Y. C., describing arc welding, oxy-acetylene welding and cutting, and welded structural design publications based on company's experience.

Bearing Application Procedures

Fifth in series of engineering service manuals outlining principal steps required in developing overseas ball bearing mounting is issued by **New Departure Div. of General Motors Corp.**, Bristol, Conn. Contained are marginal references to other manuals in series covering subjects in greater detail.

Searching Units

Seen as an aid to welding engineers is Sales Data Sheet 3021, offered by **Sperry Products, Inc.**, 1505 Willow Ave., Hoboken, N. J., describing new angle searching units used with standard supersonic Reflectoscope for inspection of welds in plate, thin sheet and other sections.

Gages Low-Speed Airflow

Data are available from **Precision Thermometer & Instrument Co.**, 1501 Brandywine St., Phila., 30, Pa., on Kata-thermometer kit designed to afford accurate measurement of air velocities in 10-600 f.p.m. range.



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P-G-C-O-A. Permit No. 6

Atlas-NEA Divorce No Hardship

Divestment order gives holding company 18 months and alternative methods to dispose of carrier's stock.

The Civil Aeronautics Board order directing Atlas Corp. to dispose of its stock interest in Northeast Airlines, Inc., should not place an undue hardship on the holding company.

The Board has given Atlas a period of 18 months from Apr. 23, 1948, to effect this adjustment. This provides considerable latitude and flexibility in any contemplated plans.

▶ **In a Better Position** — Atlas Corp. owns 100,000 shares or 20 percent of Northeast's outstanding 500,000 shares of common stock. Earlier this year, the carrier marketed a new issue of 83,333 shares of $1 convertible preferred stock. This did not represent new funds brought into the airline but merely permitted the recasting of the capital structure. The proceeds of approximately $1,500,000 were used to retire debts held by Atlas Corp. The holding company underwrote the preferred shares and took down 92 percent of the total. In other words, Atlas, for the most part, in this instance substituted preferred stock for its notes. This transaction places Atlas in a better position to comply with the CAB order.

It is interesting to note that the Board ruling directs Atlas to "dispose by sale or otherwise" of all shares of Northeast owned by it in excess of three percent of the outstanding shares of each class.

In other words, there is no ironclad proviso that the only way out is to "sell" the shares held and hence control of the carrier. This removes the holding company from the threat of having to effect a forced sale on terms dictated by any prospective buyer.

▶ **Alternatives Available** — Instead, the holding company may negotiate any contemplated sale without undue hardship. Should such a sale fail to materialize, there are other avenues available to Atlas in complying with the Board order. All the Northeast shares owned by Atlas may be placed in an independent trust or they may be distributed as stock dividends to the shareholders of Atlas. There is ample precedent for either or both courses.

The stock distribution method may be the ultimate course in this instance. A trusteeship would not completely eliminate Atlas' responsibility to the carrier by virtue of its ownership. Should the Northeast shares be distributed, the airline will have the distinction of possessing the greatest number of stockholders in the industry. Atlas is estimated to have about 32,500 shareholders.

▶ **Other Problems** — Northeast would also be faced with many other problems once it was without financial sponsorship.

The Atlas Corp. investment in Northeast shows a substantial loss at the present time. While no accurate figures are available, it is believed that its average cost on the common was around $7.50 per share as compared with the current market of around $3.00, thus indicating a loss of about $450,000 on this class of stock alone. The preferred stock was acquired at an indicated price of $20 per share. The first dividend due last month on these shares was omitted. It is highly unlikely that this senior stock could be sold at the indicated price under current circumstances. It is possible that the loss on the preferred shares, if a free market prevailed, would run as high as $750,000 or about one-half of their indicated price.

Should the Atlas disposition of its Northeast holdings take the above assumed course, it will be the first time in history that a holding company making such divestment has suffered a substantial loss in the process.

▶ **Profitable Divestment** — The most profitable divestment took place in late 1945 when CAB ordered the then Aviation Corp. to dispose of its 287,538 shares or 22.3 percent of the outstanding common stock of American Airlines. This order was complied with and the bulk of airline shares was sold at a profit of around $17 million before applicable taxes.

The same Aviation Corp., now Avco Manufacturing Corp., sold its controlling interest in Convair to the Atlas Corp. late last year.

The current CAB order on the Atlas disposition of Northeast is made mandatory by Section 408 of the Civil Aeronautics Act of 1938. This section prohibits any air carrier to be controlled or affiliated with "any person engaged in any phase of aeronautics other than as an air carrier." The Atlas Corp. now owns 131,900 shares of Consolidated Vultee Aircraft Corp. which results in a conflict of interests under the Act.

▶ **Purpose of Stipulation**—This stipulation was designed primarily to preclude an aircraft manufacturer from selling equipment to an affiliated air carrier at inflated prices with the cost being borne by higher charges to the public.

This philosophy actually predates the CAA Act and in 1934 led to the dissolution of the old United Aircraft and Transport Corp. and the formation of three separate and independent enterprises, the present United Air Lines, Inc., United Aircraft Corp. and the Boeing Airplane Co.

North American Aviation Corp., which had managed through a technicality to maintain ownership of the properties now comprising Eastern Air Lines after 1934, finally was forced by the 1938 statute to dispose of its air transport subsidiary.

▶ **Shares Trusteed**—The Aviation Corp. divestment might have occurred in 1941 had it not been for the war. In July, 1941, the Aviation Corp. converted American Airlines debentures and received 193,769 shares of the old $10 par American common stock. At that time, such stock represented 33.7 percent of the total. Recognizing that there might be a conflict as to what represented control, Aviation Corp. arranged to trustee the shares with Jesse Jones, then chairman of Reconstruction Finance Corp.

Evidently, the government acquiesced in view of the airline's participation in the national defense program. This non-voting trust arrangement was to expire six months after the termination of the national emergency.

The Aviation Corp. sold 50,000 shares of this stock shortly after it was placed in trust. In the intervening years, American Airlines split its stock two for one and again five for one. While all this was going on, American's earnings continued to grow, with its shares showing substantial market appreciation.

▶ **At Peak Prices**—It is difficult to determine whether the Aviation Corp. management would have voluntarily sold its American Airlines shares when it did early in 1946 were it not for the CAB divestment order. It may well have done so in any event, as the long term course of that holding company management has been to leave the aviation field. The fact remains, however, that the American Airlines sale was made virtually at peak market prices.

The Atlas Corp. does not have the happy prospect of disposing of its Northeast investment at a profit but presumably must content itself with the hope of confining the extent of its loss.

—Selig Altschul

Luscombe's Four-Placer on Market

Priced lower than all-level planes its size, Sedan bears company's hopes for a profitable year.

Luscombe Airplane Corp., Dallas, last week rolled its new 165-hp. Silvaire Sedan into the four-placer show ring. Fully certificated by CAA and ready to go, it is priced at $6995 to compete with the other "sedan-size" airplanes offered a discriminating plane market.

Meanwhile, Luscombe President L. H. P. Klotz issued the financial report for the 1947 calendar year, showing a loss of $549,099, reduced to $255,099 by application of an anticipated federal tax refund carryback of $290,000.

►**Bigger Bite**—The company increased its share of the total two-place market from 8.7 percent in 1946 to 18.8 percent in 1947, and advanced to second place among all companies in two-place sales for the year. But gross sales for 1947 amounted to $3,398,967, little more than half of gross sales in 1946 ($5,900,574). In the last three months of 1947, Luscombe led all other companies in two place sales, accounting for 36.6 percent of such sales in this period.

Entering a fiercely competitive market against other four-placers, which range in price from $3825 to $13,750, the new Silvaire Sedan is the lowest priced all-metal model offered.

The plane as certificated incorporates a re designed wing in which the degree of washout was increased to improve its spin and stall characteristics. Manufacturer states that the new wing "vastly improves the takeoff, climb and stall characteristics."

►**Interior**—Interior fittings of the cabin are described as "rivaling expensive automobiles." Foam rubber seat cushions and backs are covered with beige pinstripe wool fabric, which is also used on doors and side panels. Floor is carpeted in maroon.

Equipment includes such niceties as chrome rear seat ash trays with individual cigarette lighters, auto-type dome light, leather handholds for front and rear seats, rear seat arm rests, map pockets, roll-back sunshades for overhead windows, individually adjustable front seats, and individual seat cushions on rear seat.

Instrument panel has a single unit airspeed and engine instrument group similar to instrument arrangement on some 1948 model automobiles. Dual control wheels are plastic dipped.

Other standard equipment includes cabin heater and ventilator system, stainless steel mufflers, starter, generator and battery, position lights, instrument panel lights, Fiberglas sound proofing, and twin landing lights placed below the propeller hub in the nose to eliminate reflection during night landings.

►**Performance**—The 165 hp. Continental engine which powers the plane is fitted with a fixed pitch Sensenich wood propeller as standard equipment. With a controllable pitch propeller, soon to be offered as optional equipment, Luscombe claims that the plane will take off shorter and climb faster than any other four-placer on the market.

The controllable pitch propeller also is expected to increase cruising speed by approximately 10 mph. above the figures quoted for the fixed pitch propeller version (130 mph.). Top speed with the fixed pitch propeller is put at 145 mph., rate of climb at sea level with full gross load of 2280 lb. in excess of 850 ft./min. and ceiling at 18,000 ft.

With 40 gal. gasoline capacity in its two wing tanks, the plane has a range of more than 500 miles. It can carry a useful load of 1000 lb. and 100-lb. of baggage. Removal of rear and right front seats provides 60 cu. ft. of space in which 600 lb. of cargo can be carried in addition to pilot and fuel.

Previous AVIATION WEEK stories about the Silvaire Sedan prototype (Aug. 11, Aug. 25 and Nov. 17, 1947) noted roominess and superior visibility characteristics of the plane.

Designed for stability and ease of flying, the Sedan is equipped with spring interconneeted ailerons and rudder giving two-control simplicity in flight, with separate rudder control if needed.

►**Delay**—The Luscombe annual report attributes the delay in bringing out the Sedan, first shown last August, partly to the wing change and partly to engineering concentration on the new Luscombe Tandem 90 hp. two-place Observer, designed for military liaison plane markets. After certification of the Observer in March, the engineers finished up the work on the





BAUMANN BRIGADIER

Baumann Aircraft Corp.'s "Brigadier 250" is shown in single engine flight. The Burbank, Calif., company claims that the five place aircraft will maintain altitude on one engine for its entire range. Powered by twin 125 hp. Continental pusher type engines, the 'Brigadier 250" cruises at better than 150 mph. Roominess of the interior is shown by the more than ample seating arrangement for five people. Cabin is reputed to be exceptionally quiet in flight because of the pusher power. Jack Baumann, president, cites his company's showing of less than $22-per pound average cost for development of the craft, as compared with an industry average cost of $300-$1000.

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NAVION PULLS IN WHEELS

Action picture shows how Ryan Navion tucks its tricycle undercarriage into its nose and wings. Made from a closeup camera vantage point, the photo "stops" the hydraulic retraction mechanism midway in

four-placer in short order

Listed as major improvements on the two-place all-metal Luscombes in the annual report are the Silflex tapered tubular steel landing gear, incorporated in January as standard on all models, a child's jump seat offered as optional equipment for the de luxe Silvaire and installed in the baggage compartment space, available beginning last fall, and a new instrument panel, introduced for the de luxe Silvaire in January. Two 90-hp model Silvaires were added to the two-place line.

►**Complete Line**—With the addition of the Sedan to the other Luscombe models, the company now asserts it is offering the lowest priced all-metal 65 hp., 861 hp., 90-hp., and four-place planes on the market.

Luscombe attributes its 1947 loss to liquidation of excess inventory, and narrower profit margins.

Klotz sees a "considerably brighter" outlook for 1948, despite a slow starting first quarter.

operation just after takeoff. Main wheels retract flush into wingwells, but nosewheel extends slightly from its well when fully retracted. Non-retracting leafspring tailskid provides insurance against scraping the tail.

Spray Combine

Kansas operator employs 40 planes in a big-time crop-dusting business.

A large combined crop spraying operation, using 40 airplanes recruited from plane owners and operators in his area is being conducted by Don Pratt, Hays, Kans.

Pratt has purchased 10 trailer tank trucks of 2000 gallon capacity, giving him a total capacity in the field of 20,000 gallons of "24D," the spray used.

A study of his operation by a CAA representative revealed that in one morning Pratt's combined operation had sprayed 7000 acres.

►**Spray Clinic**—Pratt operates a spray clinic and school, and each pilot who works in his "combine" is checked through his school before he is assigned in the field. Acreage is being booked for spraying at the rate of 7000 acres a day.

At the time of the study, Pratt had 600,000 acres booked, which represents only 5 percent of the planted acreage in 54 counties in western Kansas, where his operation is centered.

Each plane is bonded for crop damage at an insurance cost of $500 a plane. Charge per acre for spraying runs from $2 to $2.50.

Pratt is conducting local radio and newspaper advertising campaigns in the area, and assignments are being handled through a central office which has detailed maps of all counties of the state.

►**How It Works**—A spray crew includes four flagmen, two planes and four pilots (or four planes and eight pilots), two tank trailers with drivers, and a station wagon with supervisor. Flagmen are lined up on a field and direct pilots for ground coverage.

While pilots are working on one field, supervisor moves extra flagmen to field to be sprayed next, and a tank truck is dispatched to the new field. As soon as the first field is completed it is a matter of minutes before the second field is being sprayed. Pilots fly in shifts of 40 minutes to an hour, depending on activity.

Pilots who own spray equipment which is being used in this combined operation are believed to be making more net income than they could make by operating as sprayers on a small, individual basis, Pratt reports.

He is assisted by S. L. Timmons, an expert on the type of spray used—24D.



FIRST FAMILY CRUISER DELIVERY

W. T. Piper makes personal delivery of the first four-place Piper Family Cruiser to Louis Shackett, sales manager of Martin Aircraft Corp., Long Beach, Calif. The 115 hp Lycoming powered plane, Piper's bid to regain top rank, is the lowest priced four-placer on the market, pricetagged at $3825 flyaway, Lock Haven, Pa.

ADMA Directory

Aviation Distributors and Manufacturers Association 1948 membership directory lists 35 distributors' firms and 52 manufacturers of aviation equipment and accessories as members.

Attractive format of the directory is seen as another indication of the steady growth in stature of this trade association, which had only 30 members at the time of its first annual meeting in St. Louis in 1943. Next ADMA session, the midyear meeting, is scheduled for June 17, 18 at the Grand Hotel, Mackinac Island, Mich.

Plane Parts Service

Spokane Skyways of Spokane, Wash., has inaugurated a machinery parts service for farmers in the important farming area surrounding that city. In case of machinery breakdowns, a plane with the part often will be able to land in the field near the scene of the breakdown, according to Manager M. W. Weekley.

CAB Issues Reports On Two Accidents

CAB finding last week confirmed preliminary investigation reports on the accident near Lakeview, Ore., Oct. 28, 1947, which killed Gov. Earl Snell, of Oregon, two other passengers and the pilot, Clifford Hogue.

The Board found that probable cause of the accident was the pilot's flying in instrument weather without training and experience necessary to control his plane, which was a four-place Beech Bonanza.

►**Another Crash**—CAB also issued a report on a crash Aug. 27, 1947. A pilot who inadvertently shut off a fuel valve while attempting to apply carburetor heat was believed to have caused the accident. The pilot, James E. Richardson, and a passenger, A. C. Bauman, both of Columbia, Mo., were killed. The Aeronca Champion in which they were flying was badly damaged.

Report showed that the fuel shutoff valve was closed, when the plane was examined and elevator was trimmed to full tail-down position. The report said it appears probable that the pilot, intending to land in a field, attempted to apply carburetor heat before reducing engine power, and inadvertently closed the nearby and very similar fuel valve control.

Plane was circling low when the engine stopped and the plane stalled and fell to the ground. Board finding: probable cause was loss of control at an altitude too low for recovery.

Lawler Elected Aeronca President

Election of John A. Lawler, former assistant treasurer and aircraft division controller of Curtiss-Wright Corp., as president of Aeronca Aircraft Corp., has been announced by Maynard F. Simond, board chairman.

►**Long Association**—Lawler had been associated with Curtiss-Wright since 1941 in operations of the plant at Buffalo, St. Louis, Louisville and Columbus. He will assume his new duties shortly.

Aeronca has been without a president since resignation of John Friedlander, last November. During the interim the plant has been directed by Elmer L. Sutherland, vice president and general manager, who last week announced his resignation.

Simond also announced that S. J. Kuderer has been named secretary-treasurer of the corporation. Kuderer has been associated with Aeronca since 1942.

BRIEFING FOR DEALERS & DISTRIBUTORS

INSTITUTE ROADSHOW—A flying panel of personal plane authorities was scheduled to leave LaGuardia Field today for visits with aeronautical engineers in Detroit, Wichita and Dayton, under auspices of the Institute of Aeronautical Sciences. The three stop tour this year takes the place of the usual spring Personal Aircraft Meeting of the Institute held for the last several years in Detroit.

The idea is to bring the meeting to principal personal aviation centers, so that a larger number of engineers can benefit.

Grover Loening, NACA consultant and advisor to Defense Secretary Forrestal, is chairman of the panel, which includes Art Tully, former Massachusetts aeronautics director and co-author of the recent Bollinger-Tully study on personal aircraft business, Prof. Fred E. Weick, designer of the Ercoupe, and research professor at Texas A & M College, and Wolfgang Langewiesche, author of "Stick and Rudder," and other aviation books, and research pilot for Kollsman Instrument Division, Square D Co.

Esso (Standard Oil Co. N. J.) is providing the "air lift" for the tour. Local members of the Institute will be represented with the traveling panel in discussion at each meeting, with forum sessions following. Subject for the discussions is the provocative question: "Can Further Development Extend Personal Aircraft Utility?"

LUSCOMBE RAZZLE DAZZLE—"I get a big boot out of Luscombe," a fixed base operator recently told the writer of this column. "They have an idea a minute down there. They have more different models than anybody, and look at this Silvairizing deal they are getting together now."

The operator is one of the few airplane vendors in the country who is somewhat of a high-powered razzle dazzle salesman himself, and he recognized the techniques. Latest from the Luscombe sales trick bag is a new 1949 model—the first, as far as we know, introduced by any personal plane manufacturer.

The new model is the 1949 all-metal Silvaire 90 deluxe two-placer. Main changes in the plane are in styling, inside and out, and improved comfort, but it has a new square rudder which gives it a changed silhouette and it is priced at $3395 flyaway, which is $200 below the price of the 1948 deluxe 90.

Redesigned foam rubber cushion seats, new soundproofing and mufflers, new ventilation and heating system, and such minor items as redesign of seatback adjustment, improved window latches, dome light, ash tray, invisible fasteners are new features.

New prop spinner, radiator grills and bronze striping add to the plane's new look. Deliveries were to start June 1.

AIRPORT OPERATING PRACTICES—National Aeronautic Association started its 1948 inspection of Airports for Certificates of Good Operating Practices on June 1. Airports are rated against lists of 38 mandatory requirements for safe operation, and must meet at least 20 to 50 other desirable practices which are listed on the check-sheet.

Rating sheets for the airports in each state are being mailed to state officials who will direct inspections and aid in certifying the judging. As a result of 1947 inspections, certificates were presented to 493 airports in 34 states, Pennsylvania leading with 71 good practice airports.

ISO-REV PROPELLER REVIVED—Revival of the Iso-Rev constant speed propeller for small aircraft, with possibilities of application for military liaison planes as well as civilian planes is being considered. Fairchild Engine & Airplane Corp. has an experimental interest in the propeller, which utilizes the principle of the variable ratio V-belt drive.

Two drives are used, one with a fixed ratio and the other variable. Pitch change is effected when there is any variation between the ratios of the two drives. The Iso-Rev was announced in 1945, after several years of experimental work, by the Zimmer Thomson Corp., Long Island City, N. Y.

One of the simplest mechanisms yet developed for propeller pitch change, it offers interesting possibilities in competition with other variable pitch propellers now being marketed. With market trend decidedly pointing toward more four-place personal planes for business and farm use, it is probable that there will be a greater demand for variable pitch propellers and the improved performance that they make possible.

ALEXANDER McSURELY

Athens Letter:

American Aid for Greek Aviation

U. S. furnishes Greek army with planes and airports; with money, materials and know-how for reconstruction.

In spite of the fierce civil war raging in Greece since the liberation of the country from the German and Italian occupation, Greek civil and military aviation has been considerably developed during the past twelve months, thanks in the main to the help it received from the American Mission for Aid to Greece (AMAG).

▶**Accent on Military**—The accent naturally is laid for the present, on military planes for the annihilation of the Communist-led partisan bands which operate in the mountainous parts of the country. Civil aviation, however, also has made remarkable progress.

On the military side, a new group of American Army planes recently has been delivered to the Royal Hellenic Air Force by the U. S. Army Group of AMAG. The planes were flown to Athens by pilots of the 86th U. S. Fighter Group in Germany. They were drawn from U. S. Air Force surplus stock but had been used only for instrument training. American officers said the planes are in excellent condition and can be used for observation, reconnaissance and combat operations.

▶**Plane Cost**—Each plane originally cost the U. S. Government more than $25,000, but they were sold to AMAG for the Greek Government at only about $10,000 each. This is the second group of American Army planes turned over to the RHAF, the first group arrived during February of this year.

The chief of the air section of the Joint U. S. Military Advisory Planning Group (JUSMAPG) in Greece is Brigadier General William A. Matheny. Born in North Dakota in 1902, Gen. Matheny graduated as an electrical engineer from Marquette University in 1926. In 1929, he served as an aviation cadet and was commissioned a lieutenant in the Air Corps Reserve. Formerly deputy commanding general of the 12th Air Force at March Field, Calif., he was made air adviser to Lieutenant General James A. Van Fleet, chief of the U. S. Army Group in Greece last month.

AIRPORT RECONSTRUCTION

Besides giving planes to the RHAF, the main effort of AMAG, as far as aviation is concerned, is directed toward reconstruction of airports all over the country. Most of the Greek airports had only dry-weather strips, or had been severely bombed during the war. At present, the work is concentrated mainly on the modernization and improvement of the six major airfields to make them available for all-weather use, to wit:

At Hassani (Athens airport), the program includes renovation of the drainage system, improvements to the radio communications system, resurfacing parts of the main runway. Work is approximately 50% complete.

At Kozani, the original program (grading and drainage and placing of pierced steel planks) is completed. Widening of the runway is now in progress.

At Sedes (Salonika airport), the project includes grading, draining, and surfacing taxiways and runways with pierced steel planking. It is practically completed.

At Larissa, grading and drainage, building of concrete taxiway, and improvement of present concrete runway work is 60% complete.

At Kavalla, where grading and drainage of the airfield, and surfacing of the runway with pierced steel planking is under way, the work is about 40% complete.

At Jannina, surveys are completed and materials are being assembled to grade and drain the airfield and surface the runway with pierced steel plank.

The American Mission pays all costs and furnishes all materials including over $1,000,000 worth of pierced steel planking. Two million square feet of such planking have already been ordered in the U. S. for these jobs.

▶**On Schedule**—Officials of AMAG and the U. S. Army Corps of Engineers say reconstruction of airports in Northern Greece is progressing "right on schedule."

An American engineering firm, Atkinson-Drake-Park (a group made of Guy F. Atkinson, Inc., San Francisco, Johnson, Drake & Piper, Minneapolis and New York, and Starr, Park & Freeman, New York) is handling airport reconstruction, as well as road reconstruction and the rebuilding of railway and highway bridges.

The work is under the overall supervision of the U. S. Army Group of Engineers (Grecian District), headed by Colonel D. W. Griffith. Atkinson-Drake-Park employ about 1300 Greek workmen on the road-building and airfield jobs. Their American staff in Northern Greece consists of only 32 persons.

INSECT CONTROL

Aviation is also playing a very important part in the fight against malaria and other diseases. Twenty small airplanes for insect control spraying of DDT arrived recently at Piraeus aboard an American freighter, which also carried five tons of equipment and spare parts for the planes.

CIVILIAN TRANSPORTS

Since March of this year, when a new Greek civilian airline, the Hellenic Air Lines, was inaugurated, there have been two competitive domestic airlines operating in Greece. The oldest one, the Greek Airlines (TAE), concentrates mainly on connecting the principal cities of the country with one another and has a fairly extended domestic net, which includes three daily flights between Athens and Salonika. The Hellenic Airlines (HELLAS) also runs three departures daily between Athens and Salonika. At present, no communication by land route, either rail or road, is possible between the two largest towns of Greece, due to guerrilla activity and war time destruction of travel-lanes.

Hellas also makes two flights weekly to London, two to Alexandria, Egypt, a daily flight to Crete, and a twice weekly flight to Rhodes.—**Ernest Hediger**

British Air Show Open to The Public

Society of British Aircraft Constructors' ninth annual air show and exhibit will be open to the public this year for the first time.

The event, to be staged at the Royal Aircraft Establishment's airfield, Farnborough, Hampshire, will run from Sept. 7-12. More than 50 of Britain's latest civil and military aircraft will participate in flying programs each day, and at least 12 planes will be making their initial appearance. In addition, some 200 stands will exhibit up-to-date products of British aircraft, engine and accessory manufacturers.

First four days of the air show will be set aside for overseas buyers, technicians, and other guests of the sponsoring Society.

The public will be admitted Sept. 11 and 12.

Coast-to-Coast Nonskeds Attacked

CAB cites "regularity" of irregular operators and lifts permit of carrier offering $99 cross-continent fare.

By Charles Adams

Bargain counter coast-to-coast airline passenger fares—a thorn in the side of the certificated transcontinental carriers during most of the postwar period—may be headed for eclipse.

Reason is that CAB again is gunning for Edward Ware Tabor, spectacular president of Trans Atlantic Airways. CAB's concern is not with the cut rate coast-to-coast fares which range down to $99, but with the regularity of flights by a presumably "irregular" operator. Other nonscheduled operators soon may be entangled in the same net.

▶**Action Against Standard**—The Board already has suspended TAA's letter of registration as an irregular air carrier for alleged "willful and knowing" violations of the Civil Aeronautics Act. Tabor also must show cause why the letter should not be revoked. Simultaneously with the action against Trans Atlantic, CAB ordered Standard Air Lines, Long Beach, Calif., to show cause why it should not lose its authorization to operate as a nonscheduled carrier.

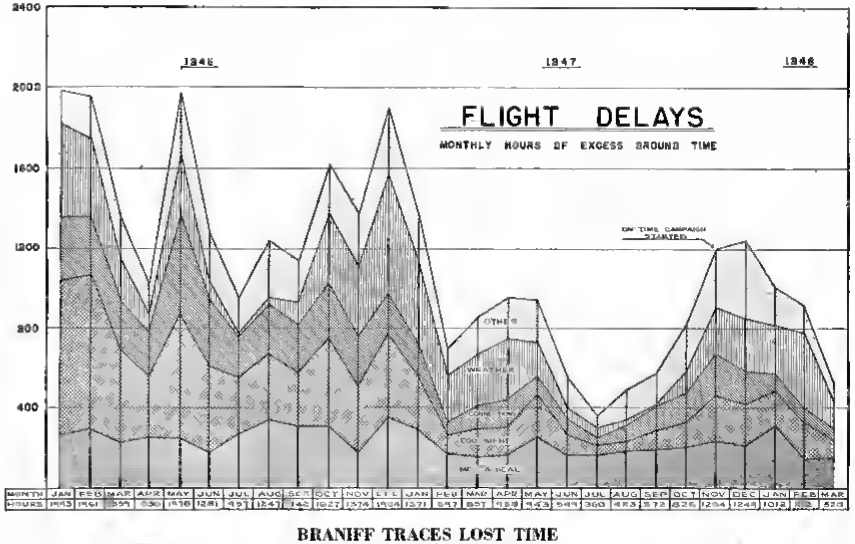
While Tabor's $99 coast-to-coast operation is best known (AVIATION WEEK, Mar. 15), his future inactivity would not mean the complete elimination of less than $100 transcontinental fares. Another company, Airplane Charter by Mercer, based at Burbank, Calif., also offers tickets at $99 plus tax.

▶**Higher Fare**—Standard Air Lines in the past has operated with the more conventional $118.30 coast-to-coast rate offered by several other nonscheduled companies. In the estimation of most uncertificated transcontinental carriers, Tabor's Trans Atlantic Airways and Airplane Charter by Mercer are offering uneconomic and cutthroat competition.

The certificated airlines during recent months have maintained an almost complete official silence concerning their nonscheduled competition. But protests to CAB have been numerous—although informal so as not to publicize the fact that irregular services exist. Certificated lines charge $143.15 plus tax for the transcontinental flight.

▶**Flights Increase** — Nonscheduled activity on the coast-to-coast run apparently was headed for another peak this spring prior to CAB's action against Tabor and Standard. A similar boom developed during the first three quarters of 1946, but stricter regulations and an enforcement crackdown severely restricted activity during most of 1947.

Besides Trans Atlantic, Standard and Airplane Charter by Mercer, a number of other uncertificated operators have been engaged in transcontinental service. These include Viking Airlines, Airline Transport Carriers, Inc., NATS Air Transportation Service and SSW, Inc., which operate out of the Los Angeles-San Francisco area, and Seattle



Course of monthly flight delays and the effect of its on-time program have been traced by Braniff Airways. Graph shows fluctuations in excessive ground time from a peak of 1993 hours in January, 1946, to a low of 360 hours in July, 1947. With the end of the intensive on-time campaign began last November, March, 1948, shows up as the second best month in over two years. Weather delays during the past winter were cut sharply with the help of ILS facilities. Braniff expects new records this summer.

BRANIFF TRACES LOST TIME

Air Charter, Aviation Corp. of Seattle, Rainier Air Freight Lines, Standard Air Cargo and Yakima Sky Chief, which operate out of bases in the Pacific Northwest.

▶**Few Accidents**—Safety record among irregular carriers on the transcontinental run has been good during the past year—considerably better than on the busy New York to Puerto Rico route. In 1946, however, a series of crashes involving nonscheduled coast-to-coast lines brought a Congressional investigation and spurred CAB restrictions.

Precisely how much traffic is handled by nonscheduled carriers flying between the East and West Coasts still is uncertain. But CAB has tightened its requirements governing operational reports, and it is likely that complete data will be available shortly.

▶**Planes Listed**—Amount of equipment used also is subject to speculation. Some of the planes are employed in strictly contract operations or on nonscheduled services other than the transcontinental route. Early this spring, four of the operators—Viking, Standard, Airline Transport Carriers and Trans Atlantic—had 24 planes, including 22 DC-3s, a DC-4 and a C-46. As a result of numerous leasing agreements, equipment figures vary widely from month to month.

More or less frequent contacts between Tabor and CAB's enforcement and litigation section date back to August, 1946. As president of Trans-Luxury Airlines, Tabor early in 1947 accepted a cease and desist order after being cited for engaging in scheduled air transportation in violation of the Civil Aeronautics Act.

The charges against Tabor in the present proceeding are numerous and detailed. Trans Atlantic was cited for exceeding in both frequency and regularity the operating pattern permitted for irregular lines under CAB's nonscheduled exemption. The alleged violations occurred both on the transcontinental route and between New York and Puerto Rico.

▶**Violations Cited**—Through frequent advertisements in New York and California papers, Tabor purportedly offered his services to the public as a regular rather than an irregular operator. It is alleged that ads stating TAA's operations were approved by CAB misled the public. The board declared that Trans Atlantic in many instances charged less (and in some cases more) for its services than was specified in tariffs filed with CAB. Further, required operational reports had not been filed with the Board.

Like Trans Atlantic, Standard Air Lines was cited for "willful and knowing" violations of the Civil Aeronautics Act—for operating with greater frequency and regularity than permitted by the nonscheduled exemption, for informing the public its services were regular, for violating tariff regulations and for failing to make proper reports to CAB.

Organized around January, 1946, as Fireball Air Express, Standard changed its name in June of that year. Since July, 1946, its principal activity has been carrying passengers transcontinentally. In April, 1947, Standard was warned by CAB to adjust its operations in accordance with the nonscheduled regulations.

▶**Agreement Disclosed** — Also under CAB's scrutiny is Standard's alleged agreement with Airline Transport Carriers, NATS Air Transportation Service, SSW and Viking providing for combination of services and apportionment of traffic on the transcontinental run. This pact was not filed with the Board for approval.

Whether CAB will be able to put Tabor down for the long count is debatable. If nonscheduled activity is barred to him through revocation of his letter of registration, he may turn exclusively to performing strictly contract work.

▶**New Regulations** — CAB is taking steps to prevent personnel of any carrier whose letter of registration has been revoked from dissolving their corporate identity and forming a new firm (AVIATION WEEK, May 17). This proposed regulation would be particularly valuable to CAB now that a renewed campaign against alleged violators of the nonscheduled exemption is under way.

It is believed that Tabor and Standard were subjects of CAB's first two show cause orders because the file of evidence against them is fairly complete. Building up data involving frequency and regularity of operation by a nonscheduled line takes considerable time, but now cases against other irregular operators reportedly are being developed.

B. A. Flights Stymied

McGraw Hill World News

BUENOS AIRES — The unsigned "annex" to the bilateral trade agreement which the U. S. and Argentina concluded last year is stymying action on routes and flight frequencies to Buenos Aires.

Panagra and Pan American Airways, as a result, are unable to increase their flights on the Buenos Aires run to meet passenger demands. At the same time, CAB's permit to Braniff Airlines to fly from southern U. S. to Buenos Aires is nullified in view of Argentina's failure to act on a request for landing rights in that country.

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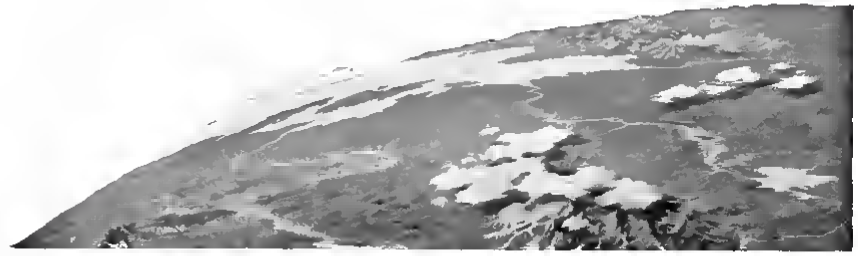
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Idlewild Fees

Carriers get charge schedule for New York International Airport.

The Port of New York Authority has sent domestic and overseas air carriers a schedule of charges adopted for use at New York International Airport (Idlewild).

▶**Flexible Charges**—Howard S. Cullman, chairman of the Port Authority, made it clear that the charges would be flexible and subject to change on a year-to-year basis to reflect changing costs.

He noted that airline landing and rental fees over the whole country amounted to less than 2 percent of total airline expenses, and said that "an airport operator cannot operate under a fixed long-term price structure any more than other suppliers of service to air carriers."

▶**Reflect Costs**—"For example," Cullman continued, 'there is no competition for aviation gasoline business at this time and prices to the airlines are going up to reflect increased costs. Yet we hear no demand that oil suppliers fix their prices to the airlines or anyone else over a period of 40 years—or even two years."

Cullman evidently was trying to knock the props from under rumors of a rift between the Port Authority and the airlines on the question of no leases and airline costs on a published-tariff basis (AVIATION WEEK, May 31). Distribution of gasoline and oil to the carriers by the Port Authority (on a commingled basis) rather than through direct purchase by the carriers from the oil companies also was reported a point of disagreement.

▶**Increased Charges?**—In anticipation of increased airline charges, Cullman points out that under the new flight fees, carriers with a small number of departures per day will pay less than they do at LaGuardia. For some, such as Peruvian Airlines and SAS, both foreign carriers, the savings may total up to $300 per month.

Cullman declared that the Port Authority charges "will not discriminate between large and small carriers, foreign flag and U. S. flag carriers or between original users and late-comers at the airport."

▶**No Discrimination**—"We have had the need for equitable terms brought home to us very strongly by our analysis of the LaGuardia situation. At La Guardia . . . one domestic carrier pays an average of less than $2.00 per departure, while another pays almost $10.00. Of the users of DC-4 equipment, domestic carriers pay about $5.00 per departure, overseas carriers about $15.00, and non-scheduled and contract carriers about $52.00."

By the "aggressive development of non-flight revenues," Port Authority expects to hold landing area and other flight operations charges to a minimum. Cullman expects about two-thirds of the general airport expenses to be provided in this way.

The schedule of charges:

● Public Landing Area Charges. For each aircraft takeoff, $.0001076 per pound of maximum take-off weight. Minimum charge for each such take-off shall be $2.50.

● Public Ramp and Apron Area Charges. For each aircraft using the public ramp and apron area:

Terminating Arrivals. For the first 30 minutes or fraction thereof, 35¢; for each additional 30 minutes or fraction thereof, $2.50.

Originating Departures. For the first 60 minutes or fraction thereof, 70¢; for each additional 30 minutes or fraction thereof, $2.50.

Through Flights. For the first 60 minutes or fraction thereof, 70¢; for each additional 30 minutes or fraction thereof, $2.50.

● Public Aircraft Parking and Storage Area Charges. For the time during which an aircraft is on the public parking and storage areas following the preceding landing of such aircraft and prior to its next succeeding take-off:

Free Time. For time aggregating not more than 12 hours, no charge.

Additional Time. For each twelve hours or fraction thereof in excess of free time: (a) for each aircraft not exceeding 10,000 pounds maximum take-off weight, $1.00; (b) for each aircraft exceeding 10,000 pounds but not exceeding 25,000 pounds of maximum take-off weight, $1.50; (c) for each aircraft exceeding 25,000 pounds but not exceeding 50,000 pounds of maximum take-off weight, $2.00; (d) for each aircraft exceeding 50,000 pounds but not exceeding 75,000 pounds of maximum take-off weight, $2.50; (e) for each aircraft exceeding 75,000 pounds of maximum take-off weight, $3.50; (f) for each aircraft exceeding 100,000 pounds but not exceeding 125,000 pounds of maximum take-off weight, $5.00; (g) for aircraft exceeding 125,000 pounds but not exceeding 150,000 pounds of maximum take-off weight, $6.00.

● Incinerator Service Charges. For each aircraft arrival in connection with which the Port of New York Authority provides the service of incinerating consumed cargo such as plastic trash, garbage, $5.50.

● Porter Service Charges. For each passenger embarking upon and for each passenger disembarking from an aircraft—an amount determined by the Executive Director of the Port of New York Authority.

● Inspection Space Charges. For each passenger disembarking from an aircraft and using space made available for the inspection and examination of aircraft passengers and their property by the Bureau of Customs, the Immigration and Naturalization Service, the Public Health Service, the Bureau of Entomology and Plant Quarantine and other governmental agencies, 42¢.

● Mail Space Charges. For each pound of mail loaded on or unloaded from an aircraft—an amount determined by the Executive Director of the Port of New York Authority.

Air Parcel Post Under Fire From REA

Railway Express Agency has gone on record in opposition to establishment of an air parcel post service on the ground that it would involve unfair competition.

Testifying before a House Post Office subcommittee, Kinsey N. Merritt, REA's vice president in charge of traffic, said that proposed air parcel post rates are far lower than present air express charges and that they also would undercut rail charges on small shipments.

"It seems to us entirely unjustified that the government should perform transportation services at less than compensatory rates in competition with services rendered by privately owned carriers that must pay their own way," Merritt asserted. He noted that sending a one pound package from New York City to San Francisco would cost only 43 cents by air parcel post, compared with 98 cents by rail express and $1.00 by air express. Surface parcel post rate for carriage of the same sized package is 16 cents.

State Shares Air France With Public, Private Groups

PARIS—After operating since 1945 as a wholly nationalized concern, Air France henceforth will have 30 percent of its stock owned by public or private organizations. This concession to the growing French swing against nationalized aviation has been voted by the country's National Assembly.

The French government will continue, however, to own 70% of Air France shares.

At the same time, the Assembly voted the permanent organization of Air France. Since its nationalization in 1945 the company's structure has been on a provisional basis. So far as operations are concerned, however, the company's new status does not seem likely to herald any great changes in procedures and practices.



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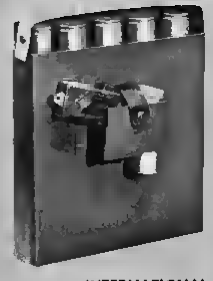
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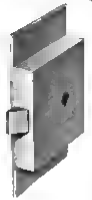
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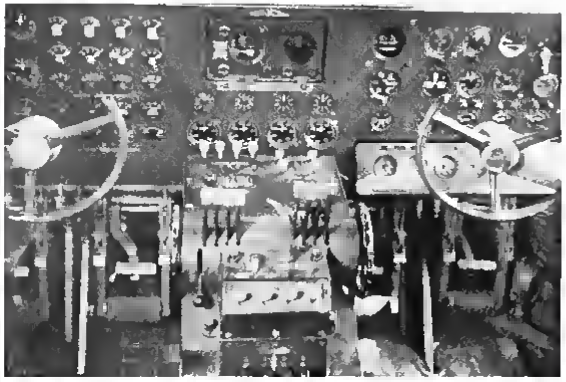
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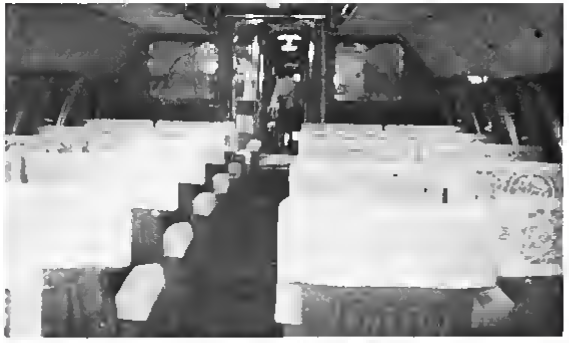
Inside Russian Transports



IL-18 Cockpit



IL-18 Passenger Cabin (capacity 66)



TU 70 Passenger Cabin (capacity 72)

Feeder Plan

Given CAB approval, NEA will sell its short-haul links to Wiggins.

Northeast Airlines has a new formula for feeder service in the heavily populated New England area. It would sell its short haul routes (bane of almost every trunkline carrier) to Wiggins Airways for $60,000.

NEA would get badly needed cash and the opportunity to concentrate on its trunk routes. Wiggins would get a larger local system to bulwark routes granted by CAB but never flown because of inadequate airports and poor traffic potential.

▶**Poor System**—Wiggins was certificated for around 660 miles of feeder routes between Boston and Albany, N. Y., in CAB's New England area decision of June, 1946. But a year later, following extensive study, Wiggins announced the system granted by the Board was inherently uneconomical and could not be operated without substantial changes.

Wiggins was unable to obtain public or private financing for the system as then set up. So it suspended further investments in the operation pending a CAB decision on extensions to New York City and other points.

▶**Links Lose Money**—Northeast, a consistent money loser, has blamed some of its troubles on short-haul business. Like Wiggins, NEA was certificated for a substantial amount of feeder service in the New England area decision. To date, Northeast has not activated much of this short-haul mileage, and the few links which were opened have operated in the red.

Under the agreement, Wiggins would pay Northeast $60,000 for tangible property at NEA stations where Wiggins will be the principal operator in the future. The money would also cover NEA's development expenses on the transferred links.

Northeast asked CAB to replace its present certificate with two certificates, one covering its trunkline services and the other its feeder operations. NEA would then ask Board approval to transfer the feeder certificate to Wiggins.

▶**Alternative Suggestion**—CAB public counsel already may have thrown a monkey wrench into the agreement. They have suggested that other carriers be given an opportunity to show they are better qualified to operate Northeast's feeder routes than the Wiggins outfit.

The agreement submitted to CAB for approval provides that Northeast will continue to operate the following routes: New York/Newark to Worcester, Providence, New Bedford, Boston, Manchester, N. H., and Portland and Bangor, Me.; Boston to Burlington, Vt., and New York to Boston via Cape Cod resort points from June 15-Sept. 30 in full cooperation with Wiggins Airways.

▶**New Vigor**—Once rid of the short-haul links, Northeast expects to have new strength for its remaining trunkline services—especially between Boston and New York, where it competes with Eastern Air Lines and American Airlines. It hopes to place Convair Liners on its Boston-New York run sometime next year.

Wiggins, meanwhile, would serve a myriad of points in New England presently certificated to Northeast, and its feeder system would extend from New York to Caribou, Me., and Burlington, Vt. Other new cities which would be added to Wiggins' system are: Islip and Riverhead, Long Island, N. Y.; Stamford Norwalk, Bridgeport, New Haven, New London and Waterbury, Conn.; Newport, R. I.; New Bedford Fall River, Oak Bluffs, Nantucket, Hyannis and Provincetown, Mass.; Concord, Portsmouth, Claremont, North Conway and Berlin, N. H.; White River Junction, Montpelier Barre and St. Johnsbury, Vt.; and Presque Isle, Houlton, Millinocket, Bangor, Belfast, Waterville, Augusta, Rockland, Brunswick, Lewiston Auburn, Saco-Biddeford and Portland, Me.

Airmail to Israel

The first airmail to the new state of Israel left the United States last week, bearing the cancellation stamp of the Jewish Agency for Palestine. Handled by Great Circle Airfreighters, Ltd., the mail, along with food parcels, clothing, and medical supplies, traveled by U. S. and foreign flag carriers to Rome, where it was put on a chartered flight to "a secret landing strip" in the newly-formed state.

While only one flight a week is in operation at this time, Great Circle anticipates adding two or three additional flights as more demands for the service increases.

The freight forwarder, in operation since October, 1947, recently received word that its chartered flight to Israel, carrying the first American citizens to enter since recognition by the United States, had arrived safely. The flight carried eight passengers and 1700 lb. of cargo.

Parcels to India

Air parcel post service to India was inaugurated last week, with rates of $1.70 for the first four ounces or fraction, and 97 cents for each succeeding four ounces or fraction.

AIRviews

"Maintenance of a healthy and expandable aircraft industry is required for national security," concludes a review of our national air policy by the Congressional Aviation Policy Board.

We in the aircraft industry heartily concur with this conclusion, because we realize the value of *continuity* in this business. And only with Government cooperation can the continuous, large-scale development of aircraft of both combat and transport types be carried on.

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I have always been and continue to be confident about the longer-range prospects for passenger and cargo transportation by air.

In the meantime it would appear sound public policy for the Government to bear a proper share of development and production costs of new air transports and cargo planes, in exchange for the assurance that in an emergency it would instantly have available for defense and military operations, the largest and the most advanced fleets of air transports in the world.

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Aviation's Value To City Estimated

The average visitor who traveled to San Francisco by airplane last year paid $20 a day into the city's revenue till.

All totaled, the indirect income from airline passengers for the fiscal year 1946-47 amounted to over $10,000,000.

►**Survey**—This came out in a recent survey of aviation's financial value to San Francisco and the Peninsula. Compiled by the city's Public Utility Commission, the report was part of a program to educate people in the community value of aviation.

Private plane passengers also did their part. During this 12-month period, 27,000 private planes carrying an average of two passengers each visited San Francisco Airport. Their spending averaged $20 for an eight hour stay. That meant $1,080,000 more for the local merchants.

The Public Utility Commission estimates:

- That direct income from private planes (oil, gas, etc.) was $24,300.
- That direct income from scheduled airlines (payrolls, engine overhaul, gas and oil, supplies) was $20,751,840.
- That direct income from wages and purchases of enterprises depending on airport for existence was $1,137,819.

The Commission reports that the total of all aviation income was $32,465,090.

►**Eleventh Largest**—San Francisco's aviation payroll is the eleventh largest of all the city's activities. It totaled $17,750,323, as compared with $18,431,170 for water transportation, $14,580,029 for banks and trust companies, $13,193,929 for hotels and lodgings, and $12,868,641 for apparel and finished goods.

Elaborating on the $20 average for an eight-hour visit by private plane passengers, the Commission states that "owners and passengers in private airplanes, being generally wealthier than average citizens, usually come to San Francisco for the specific purpose of spending money for entertainment, purchases, etc." They call the $20 average "conservative despite lack of hotel bills."

Arizona Airways Asks for Certificate

Arizona Airways, Phoenix, has asked CAB to issue the temporary feeder certificate for which the company was designated last February. It hopes to start operations in August.

President H. O. Nelson said Arizona Airways can now show that airport facilities are adequate. He stated that 17 of the 20 points authorized now have airports capable of handling DC-3s. The exceptions: Superior, Globe-Miami and Casa Grande, Ariz.

►**Financial Structure Rearranged**—In making the route award to Arizona Airways, CAB said a certificate would not be issued unless the carrier also showed within six months that it had rearranged its financial structure to place itself on a sound basis. The company had sustained substantial losses on its intrastate operations in 1946 and 1947. Last September, current liabilities were about ten times current assets.

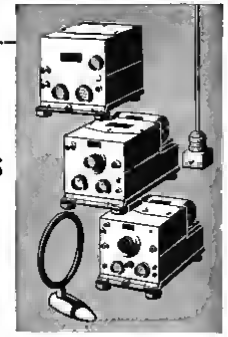
Nelson told CAB he believes Arizona Airways already has made a satisfactory rearrangement of its financial structure, stating that current assets will exceed current liabilities by three to one when the certificate is issued. The company also plans to sell the public 60,000 new shares of $2.50 par value common stock at $5 a share.

Idlewild Building

First permanent building to be constructed at New York International Airport will be occupied by the CAA Regional Office and the United States Weather Bureau through contract with the Port of New York Authority. Construction of the three-story office building will begin June 10. It will be ready for occupancy Apr. 1, 1949.

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BOAC Contract To Charter Operator

(McGraw-Hill World News)

LONDON—Skyways, Ltd., Britain's biggest air charter operator, is going to get bigger. With services shuttling out to all parts of the world, it has just landed another big contract. This one, however, is different.

First, the charterer is not an ordinary commercial customer, but BOAC, the nationalized corporation which has a monopoly of all Britain's scheduled international air transport services.

Second, the contract is not for a one-time haul, but is expected to run for quite a long period. And third, the contract calls for the operation by Skyways' planes and crews of a regular BOAC scheduled service.

►**London to Bahrein**—The service is BOAC's London-to-Bahrein (on the Persian Gulf) route where there is a heavy traffic demand that is expected to become even heavier as ERP puts more American money and more technicians of both countries into the expansion of the oil fields circling the Persian Gulf. Many of the passengers are British Government employes (Anglo-Iranian Oil Co. is 50% Government-owned), but the service is an "open" one.

BOAC will continue to be the nominal—and outward—operator, providing terminal facilities, hotel accommodations, meals, and all flight-control and meteorological services. Skyways will provide the planes (DC-4s) and the crews.

CAB SCHEDULE

June 9—Prehearing conference in Board's investigation of consolidated airfreight tariff agreement (Docket 2735 et al.)

June 10—Prehearing conference on control of Parks Air Lines. (Docket 1670.)

June 17—Oral argument on reopened portion of Mississippi Valley Area case dealing with selection of carrier on Kansas City St. Louis route. (Docket 548 et al.)

June 28—Hearing on Pan American Airways Pacific certificate amendment case (Docket 2953 et al.)

June 28—Hearing on Pan American Airways Pacific certificate amendment case (Docket 2953, et al.)

June 30—Hearing on Board's investigation of Pan American Airways' Miami-St. Thomas tariffs. (Docket 3254.)

July 12—Hearing on Capital Airlines mail rate case. (Docket 484.)

July 12—Hearing on National Airlines route consolidation case. (Docket 2967.)

Aug. 2—Hearing on Board's investigation of free and reduced rate transportation. (Docket 2737, et al.)

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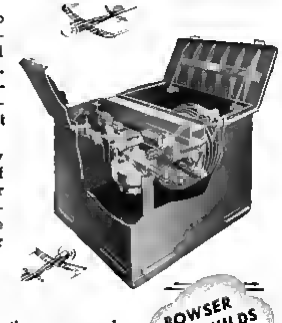
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FIGURE 230
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SHORTLINES

▶ Capital—Traffic during April and May continued to lag behind expectations, and reductions in scheduled mileage were slated to go into effect early this month to meet revised forecasts for this summer.

▶ Delta—U. S. Airlines, uncertificated cargo carrier, has protested to CAB against a proposed Delta tariff providing for shipment of fruits and vegetables at a special commodity rate of 13.3 cents a ton mile without regard to size or weight of the shipment U. S. has a 20-cents-a-ton-mile rate Willie Air Service similarly has protested a new National Airlines fruit and vegetable tariff.

▶ Nationwide Airlines—Was slated to resume daily service between upper Michigan and Detroit and Lansing late last month Carrier has been operating three days a week, serving Menominee, Escanaba, Iron Mountain and Houghton in upper Michigan.

▶ Pan American—During the first quarter of 1948 flew 262,984,000 passenger miles against 227,309,000 in the first quarter last year Acme Fast Freight, Inc., one of the nation's largest freight forwarders, has designated 53 of its receiving stations in 23 states as points for handling PAA cargo traffic Expansion of the Acme-PAA setup to include 140 stations in the U S is anticipated.

▶ Philippine Air Lines—Has inaugurated weekly DC-6 sleeper service between San Francisco and Manila.

▶ Pioneer—Expects to be in the black by July 1 despite substantial losses during January and February April traffic was the largest in the feeder's history, and passenger business during the first four months of 1948 was up 61 percent over the same 1947 period Company has asked CAB to extend its routes beyond Midland-Odessa, Tex., to El Paso via Pecos, Tex., and beyond El Paso to Albuquerque, N. M., via Las Cruces, Hot Springs and Socorro, N. M.

▶ Sabena—Late last month instituted twice weekly DC-6 service between Brussels and Johannesburg, South Africa.

▶ Slick—Reports freight volume at new peaks During a recent 24 hour period, it flew 156,701 revenue ton miles.

▶ United—Freight volume during April aggregated 1,465,338 ton miles against 676,851 ton miles in the same month last year but down seven percent from March, 1948 Express in April totaled 555,150 ton miles against 602,937 a year ago, and airmail was estimated at 658,805 ton miles compated to 719,241 in April, 1947.

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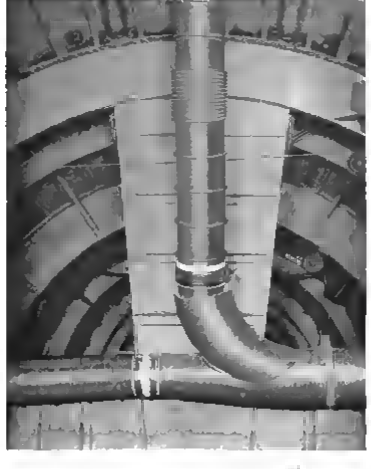
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Adams Rite Mfg. Co. 42
Agency—Sylvester Meeder Adv. Corp.

Adel Precision Products Corp. 24
Agency—The McCarty Co.

Aircraft Radio Corp. 44
Agency—Burke Dowling Adams

Bendix Aviation Corp. (Pacific Div.) Second Cover
Agency—The Shaw Co.

Bendix Products Div. of Bendix 33
Agency—MacManus, John & Adams, Inc.

Bowser, Inc. 45
Agency—Willis S. Martin Co.

Cee Bee Chemical Co. 49
Agency—Meno Advertising Co.

Chicago Metal Hose Corp. 48
Agency—Russell T. Gray Inc.

Clifford Manufacturing Co. 20
Agency—James Thomas Chirurg Co.

Curtiss-Wright Corp. Front Cover
Agency—Charles Dallas Reach Co., Inc.

Darnell Corporation Ltd. 8
Agency—Henry L. Rhea Adv. Service

Douglas Aircraft Co., Inc. 43
Agency—J. Walter Thompson Co.

Electrol, Inc. 9
Agency—G. B. Woodin Co.

Foote Bros. Gear & Machine Corp. Fourth Cover
Agency—The Buchen Co.

Kidde & Co., Inc., Walter 3
Agency—Newell-Emmett Co.

Kilgore Mfg. Co. 41
Agency—Byer & Bowman, Inc.

Linde Material Co. 27
Agency—Hamilton Adv. Agency, Inc.

Lockheed Aircraft Corp. 38, 39
Agency—Foote, Cone & Belding

Martin Co., The Glenn L. 28
Agency—Vansant, Dugdale & Co., Inc.

Micro Switch Corp. Third Cover
Agency—Hamilton Adv. Agency, Inc.

New Departure Div. G M C. 23
Agency—J. M. Hickerson, Inc.

Ohio Seamless Tube Co., The 10
Agency—Howard Swink Adv. Agency

Permanente Products Co. 10
Agency—Young & Rubicam, Inc.

Rosbinge Sons Co., John A. 4
Agency—Beatty & Oliver, Inc.

Russell Mfg. Co. 44
Agency—Charles W. Hoyt Co., Inc.

Ryerson & Son, Inc., Joseph T. 40
Agency—Aubrey, Moore & Wallace, Inc.

Searchlight Section 46, 47

Texas Company, The 6
Agency—Buchanan & Co., Inc.

Turco Products, Inc. 40
Agency—Markets, Inc.

U. S. Rubber Co. 5
Agency—Campbell-Ewald Co. of New York

Welch Holme & Clark Co., Inc. 30
Agency—The Aitkin-Kynett Co.

▲

PROFESSIONAL SERVICES 46

▲

SEARCHLIGHT SECTION
(Classified Advertising)

EMPLOYMENT
Positions Vacant 46
Positions Wanted 46

SPECIAL SERVICES
Contract Work 46

EDUCATIONAL
Books 47
Schools 46

PLANES—EQUIPMENT
(Used or Surplus New)
For Sale 46, 47

WANTED
Equipment 46

Cut Surface Cleaning Costs Up To 78%

. . . with CEE-BEE Procedures

Cee-Bee CASE STORY No. 59

Actual service tests show drastic savings

Aircraft Douglas DC-3's, DC-4's

Problem Determine costs of aluminum surface maintenance removing oxide film stains, grease and oil

Condition Aluminum surfaces in very poor condition; heavily oxidized corroded and dirty

Materials Cee-Bee Alumaloy A for removal of all grease sludge exhaust stains; Cee-Bee A-3 for cleaning and brightening aluminum

Facts and figures substantiate all statements

This wet an actual service test conducted under operator's supervision. The aircraft selected by the operator were particularly dirty, almost black with oxidation, badly corroded in spots, as pictured. Cee-Bee A-3 and Alumaloy A were used by operator's own personnel all inexperienced help. Resulting cleaning time was naturally higher than usual. Actual time and cost records were kept. These figures were inspected to yearly averages in accordance with Cee-Bee Engineered Procedures now in use by many other scheduled operators. Hourly wage rate was estimated at $1.10 average throughout. Actually, wage rates are considerably higher. Hand polishing figures are operator's actual fleet maintenance costs.

RESULTS: Aircraft appearance was highly satisfactory to operator. Cleaning compounds met operator's safety standards.

DC-3's—yearly cleaning and brightening cost, each airplane

Hand Polishing Method	$1852.00
Cee-Bee Procedures	
Wet (outdoor) method	569.00*
Dry (hangar) method	887.80

*69% SAVING

DC-4's—yearly cleaning and brightening cost, each airplane

Hand Polishing Method	$4892.00
Cee-Bee Procedures	
Wet (outdoor) method	1055.00*
Dry (hangar) method	1847.00

*78% SAVING

Complete details on this test are available on request

FAYING SURFACES ARE SAFE

Laboratory tests, field tests and actual operation prove the all-round safety of Cee-Bee materials. One international airline using Cee-Bee A-3 regularly has specimens taken from airplanes cleaned over a year ago. Taken apart after continuous service over salt water, operator reports faying surfaces showed ABSOLUTELY NO ATTACK, proof that Cee-Bee A-3 is safe. This operator commends Cee-Bee A-3 for its complete absence of harmful effects.

Cee-Bee Engineered Cleaning Procedures and materials are saving many dollars and giving operators cleaner aircraft. They can do the same for you. Write for further information.

CEE-BEE

CEE-BEE CHEMICAL COMPANY, INC.
Aviation Division
655 E. Gage Ave., Los Angeles 1, Calif.

EDITORIAL

Supersonic Flight News — A Dilemma

The Justice Department has said officially that AVIATION WEEK cannot be prosecuted for revealing last December that an Air Force rocket plane had exceeded the speed of sound.

The United Press story, dated May 27, reads:

Attorney General Tom C. Clark said today the magazine Aviation Week cannot be prosecuted for disclosing last November that an Air Force plane had flown faster than the speed of sound.

Clark told a news conference his attorneys found, after an investigation, that the magazine violated no federal law.

"Even if the disclosure were top secret," Clark said, "we could not proceed against the magazine under the law."

He said that only if there were a censorship law could such a prosecution be made.

Aviation Week said that an Army experimental plane, the Bell XS-1, had flown faster than the speed of sound a number of times at Muroc Field, Calif.

It said the plane flew at 35,000 feet. At that height the speed of sound is 660 mph.

The Air Force did not officially confirm or deny the story. But it said supersonic matters were top secret military information. It turned the matter over to the Justice Dept. for study.

Justice Dept. lawyers then ordered an FBI investigation to see if any espionage law had been violated.

Clark said today he has decided that there can be no prosecution under any espionage law because there is no evidence that the magazine intended to either endanger the United States or to help a foreign power.

The Attorney General's statement highlights a unique predicament of the Air Force and the nation's press. The Air Force does not concede that supersonic flight is here. The press is confronted with the rapidly increasing necessity of deciding when and how it can talk about it as an accomplishment.

It is difficult to see how the matter can be allowed to drift much longer.

There is not a single new U. S. fighter plane being built or designed that is not intended to attain sonic speed. This is not a military secret. Not even the Russians could expect us to plan slower planes than those we have.

The plain truth is that supersonic flight is here and will become commonplace this year. No more importance can be attached to the feat per se than is now given to the simple art of flying itself.

The initial breach of the "sonic wall" received wide publicity. The second and third airplane types which accomplish this feat will probably be worthy of similar public attention.

However, without the Air Force's present attitude toward the accomplishment of sonic flight, the scientific and military importance would lose its popular appeal within a few months. As long as the feat is officially ignored, the mystery continually deepens as the nation's curiosity is piqued. The problem of suppression can not become much more serious than it is already. Let's face it—the newest planes in our fighter stable eliminate the so called sonic barrier, and reduces supersonic speed to the commonplace.

AVIATION WEEK's staff engineering writers point out to us that this performance is not assured by any "secret configurations," but are made possible by designs that are already accepted as conventional—thin, swept wings and tails, small size, and scrupulous attention to exterior smoothness, all linked with super-power.

The Russians probably know as much about the theoretical aerodynamics of sonic speed as we do but there is some question as to the fait accomph of sonic speed in that country because it is claimed they lack fabricating techniques required for sonic aircraft. The U. S. has built up original and exclusive knowledge on the effect of surface roughness on aircraft drag, for example, particularly in the wing, and this research has revealed the unbelievably retarding effect of such things as thumb prints and specks on the lift and drag of a sonic speed wing.

A few U. S. engineers seem to doubt immediate Russian ability to conceive and utilize the latest types of rivets, to use skin sheets tapered in thickness, to master details of moulded plastic seals around certain control surface areas, to design and fabricate wings from certain alloys of the same strength characteristics as our own materials, to use cast monocoque panels, to develop beveled trailing edge and pressure-sealed aileron and elevator controls, etc. All of these are essential from the viewpoint of the sonic speed plane structure as distinguished from its aerodynamic configuration, and these are the details that Russian industry lacks, some U. S. authorities believe.

Yet there is no security attached by the military to description of these items, oddly enough. Discussion of these fine points seems to pass censorship. Still military security in connection with sonic speed is attached to the external form of the airplane, which is information the Russians know as well as we do.

This comprises the paradox that astonishes many newsmen and engineers alike. The Russians know how a sonic speed plane should look. They do not know—certain U. S. engineers contend—how it should be built.

The look the Air Force regards as classified, the technique of construction they regard as unclassified.

It is clear that AVIATION WEEK and the country's information media face a growing list of sonic speed aircraft news stories the rest of this year in the face of an Air Force security policy that is untenable with the facts.

In all friendliness and sincerity, we hope Air Force Secretary Symington and Defense Secretary Forrestal put an end to this dilemma soon.

ROBERT H. WOOD

MICRO Precision Switches

give the dependability and performance necessary for aircraft use

MICRO precision switches are known for their dependability—a feature that is a "must" with the aircraft industry. Wide usage in the field has proved this point, for today MICRO precision switches are widely used for many aircraft purposes.

MICRO precision switches are available as a complete line that incorporates 3900 characteristics of varied sizes, shapes, weights, electrical capacities, etc., so that a switch can be selected to meet practically any requirement. To meet special conditions, experienced MICRO engineers can make characteristic changes in the switch so that it is practically "tailor-made" for the job.

MICRO engineers have wide experience and are available to aid you with specific switch problems. Feel free to call them for aid or write MICRO SWITCH, Freeport, Illinois, outlining your problem.



SIZE: 2-1/8" high, 1-3/8" wide, 3/4" deep.

New in design, small in size and light in weight, with rotary actuator, for enclosing the V3-1 switch. Cast aluminum housing has two mounting holes for mounting on either face. The rotary lever arm actuator is adjustable through 360 degrees. The total travel of the roller arm is 90 degrees in either direction.



MICRO Type "H" is a light-weight, compact, high-capacity electrical switch with long life expectancy. "H" housings are light-weight, die-cast aluminum.

SIZE: 3-15/16" high, 3-11/32" wide, 1" deep.



SIZE: 2-23/64" high, 2-9/16" wide, 1-1/32" deep.

New small-size cast aluminum housing is for either one or two V3-1 switches. With two V3-1 switches, it is double-pole, double-throw. The single plunger actuator operates both plungers of enclosed switches. The housing plunger is sealed in a synthetic rubber boot, laboratory tested for aircraft service. The plunger overtravel is ¼ inch. Conduit hub is ¾-20 N.E.F. thread.

When the housing is used to enclose only one V3-1 switch, space permits use of AN 3102-10SL-3P Disconnect Receptacles. When only one V3-1 is enclosed, the unit is single-pole, double-throw.



for small size and dependable performance . . . the V3-1 MICRO Precision Switch

In spite of its small size and light weight the MICRO precision V3-1 switch has full electrical capacity and dependability. It is precision made to stand up and give full expected service. Terminals are heavy gauge brass with number 4 screws and lock washers—AN number 3234.

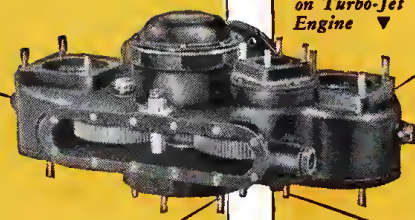
Ratings: 26.5 volts, 5 amperes at 45 000 ft. altitude; 26.5 volts, 10 amperes at sea level; Probable contact life 25 000 operations.

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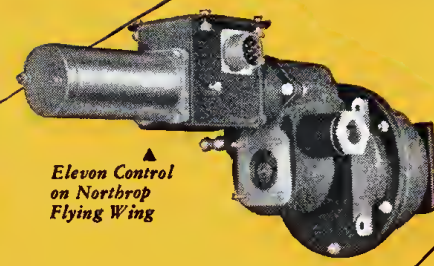
MICRO SWITCH — A DIVISION OF FIRST INDUSTRIAL CORPORATION — FREEPORT, ILLINOIS, U.S.A.

BRANCH OFFICES: CHICAGO 6, 208 W. Washington St.; NEW YORK 17, 101 Park Ave.; CLEVELAND 15, 2336 Euclid Ave.; LOS ANGELES 14, 1709 West 8th St.; BOSTON 16, 126 Newbury St.

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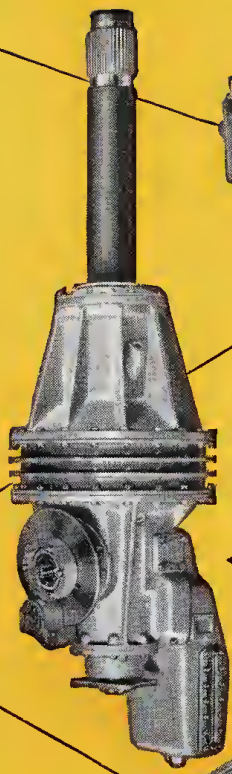
Accessory Drive on Turbo-Jet Engine ▼



▲ *Elevon Control on Northrop Flying Wing*

"Packaging" Gears

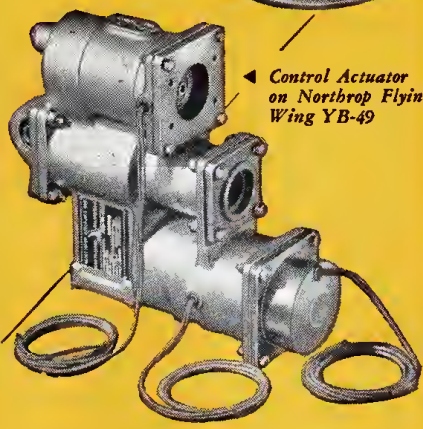
...FOR BETTER PERFORMANCE!



◀ *Main Rotor Transmission on Sikorsky Helicopter*

Planetary Transmission on Piasecki Helicopter ▶





◀ *Control Actuator on Northrop Flying Wing YB-49*

Performance of high-quality gears is affected in no small measure by the accuracy of their assembly and the precision of their mounting in their housing. Many manufacturers, recognizing this, look to Foote Bros. for complete units ready to install in the equipment they manufacture.

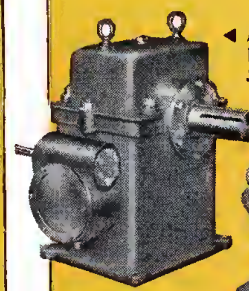
The wide experience of Foote Bros. in the production of equipment to transmit power, to reduce or increase speed, or to provide control, may be of assistance to you.

Foote Bros. Actuators and Power Units may be designed to meet virtually any practical limitation in space or weight. The "A-Q" (aircraft quality) Gears used in their construction permit operation at extremely high speeds, assure low noise level and provide unusually high efficiency.

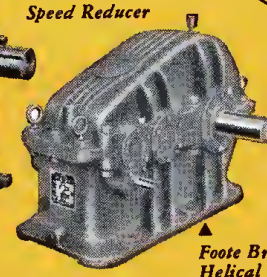
Speed Reducers for general commercial applications are available in both helical and worm gear types in a wide variety of sizes and ratios.

Foote Bros. engineers will gladly recommend the type of unit best suited to your needs or will work with you on the development of units for any special application.

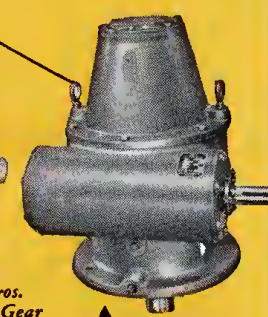
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◀ *Foote Bros. Worm Gear Speed Reducer*



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Better Power Transmission Through Better Gears